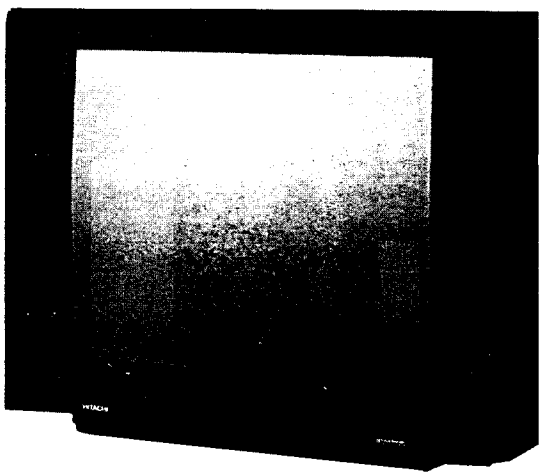
HITACHI

C2574TN
C2874TN

+ C2574TNY2 As - 25/03/95. 2079

SERVICE MANUAL

CAUTION:
Before servicing this chassis, it is important that the service technician read the "Safety Precautions" and "Product Safety Notices" in this service manual.



For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
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Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk

TECHNICAL SPECIFICATIONS

TV standard ..... 625 lines

Channel coverage ..... UHF channels 21-68 and PAL 60 (via VCR)

Aerial input impedance ..... 75 ohm unbalanced

Intermediate frequencies
- I.F. Luminance ..... 39.5 MHz
- I.F. Sound ..... 33.5 MHz
- I.F. Chrominance ..... 35.07 MHz
- F.M. Sound ..... 6.0 MHz
- Colour sub carrier ..... 4.43 MHz

Focusing ..... Electro static
Mains voltage ..... 240 V 50 Hz
Fuse 4A

Programme selectors ..... Channel UP/DOWN buttons with 59 programme remote control

T.V. Speakers ..... Left/Right 8 Ohms 12 W
Woofer 4 Ohms 15 W

Power consumption ..... C2574TN 90 W
C2874TN 96 W

Picture tube ..... C2574TN 59 cm Type
C2874TN 66 cm Type

Dimensions:	C2574TN	C2874TN
Width	701 mm	772 mm
Height	520 mm	576 mm
Depth	464 mm	500 mm
Weight	32 kg	37 kg

* Since this is a basic circuit, the values of the parts and specifications are subject to be altered for improvement

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SAFETY PRECAUTIONS

WARNING: The following precautions should be observed.

1. Do not install, remove, or handle the picture tube in any manner unless shatter proof goggles are worn. People not so equipped should be kept away while picture tubes are handled. Keep the picture tube away from the body while handling.
2. When service is required, an isolation transformer should be inserted between the power line and the receiver before any service is performed on the chassis.
3. When replacing the chassis in the cabinet, ensure all the protective devices are put back in place, such as barriers, non-metallic knobs, adjustment or compartment covers or shields, isolation resistors/capacitors, etc.
4. When service is required, observe the original lead dressing. Extra precaution should be taken to ensure correct lead dressing in the high voltage circuitry area. Particularly note the R.G.B. lead dressing. Ensure they are dressed well away from the horizontal scan and F.B.T. circuitry.
5. Always use the manufacturer's replacement component. Always replace original spacers and maintain lead lengths. Especially critical components are indicated thus ⚠ on the parts list and should not be replaced by other makes. Furthermore, where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced receiver to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently damaged during servicing.

   Therefore, the following checks are recommended for the continued protection of the customers and service technicians.

INSULATION

Insulation resistance should not be less than 10MΩ at 500V DC between the mains poles and any accessible metal parts.

Also, no flashover or breakdown should occur during the dielectric strength test, applying 3kV AC or 4.25kV DC for two seconds between the main poles and accessible metal parts.

HIGH VOLTAGE

High voltage should always be kept at the rated value of the chassis and no higher. Operating at higher voltages may cause a failure of the picture tube or high voltage supply, and also, under certain circumstances could produce X-radiation levels moderately in excess of design levels. The high voltage must not, under any circumstances, exceed 27kV on the chassis.

X-RADIATION

TUBES: The primary source of X-radiation in this receiver is the picture tube. The tube utilised for the above mentioned function in this chassis is specially constructed to limit X-radiation.

For continued X-radiation protection, replace tube with the same type as the original HITACHI approved type.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in HITACHI television receivers have special safety related characteristics. These characteristics are often not evident from visual inspection, nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified by marking with a ⚠ on the schematics and the replacement parts list contained in this service manual.

The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list of this service manual, may create electrical shock, fire, X-radiation, or other hazards.

Product Safety is continuously under review, and new instructions are issued from time to time. For the latest information, always consult the current HITACHI service manual. A subscription to, or additional copies of HITACHI service manuals, may be obtained at a nominal charge from your HITACHI SALES CORPORATION.

TUBE DISCHARGE

The line output stage can develop voltages in excess of 25kV; if the E.H.T. cap is required to be removed, discharge the anode to chassis via a high value resistor, prior to its removal from the tube.

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The tuner used on this chassis is powered by the chassis +12v and +5v supplies, and covers the UHF range of frequencies.

When tuning is performed the clock and data commands output from pins 40 and 41 of IC001 are applied to pins 4 and 5 of the tuner, and in conjunction with the 33v input at pin 7 initiates the search routine.

The I.F. output from pin 1 of the tuner is then input to the I.F. assembly unit at pin 2.

This unit will then output a composite video signal from pin 12, an F.M. audio signal from pin 10, and a QPSK (Quadrature Phase Shift Keying) signal required for NICAM decoding from pin 9.

Audio Stages:

The FM output from pin 10 of the I.F. assembly is input to pins 9 and 11 of the NICAM assembly, and the QPSK signal is input to pin 1.

NICAM or FM selection can be chosen by the remote control handset. The clock and data inputs to pins 16 and 15 of the NICAM assembly determine which signals are decoded.

The left and right audio signals output from pins 14 and 6 of the NICAM assembly, are applied via Q1320 and Q1321 stages to pins 34 and 35 of IC1401.

This is a multiple switching I.C., controlled by the clock and data signals from IC001. These are input at pins 32 and 33 of IC1401.

The left and right audio signals then emerge from pins 23 and 22, and are then applied to pins 3 and 5 of IC402.

The left and right audio signals which emerge from pins 24 and 9 of IC402 are then input to the DOLBY and EFFECTS sound processing panel. This panel enables the customer to select DOLBY, HALL or MATRIX modes etc., and is controlled by the I^2C clock and data commands from pins 40 and 41 of IC001. The circuit description for this panel will be given later.

The left and right processed signals are then returned to pins 23 and 10 of IC402 and applied to internal stages which influence the base, treble, and balance. The clock and data commands fed to pins 16 and 17 of IC402, control all these functions.

The clock and data commands also control the special effects available, such as pseudo stereo and wide stereo etc.

IC402 has two separate paths for headphone or speaker outputs.

This enables different settings of volume and balance to be applied to the headphone output.

The headphone left and right signals are output from pins 20 and 13 of IC402. They are then input to pins 7 and 6 of IC481, output from pins 1 and 3, then applied to the headphones.

The outputs for the speakers are taken from pins 18 and 15, then input to IC4451, which is the sound output IC, at pin 5 and 1.

The values of R4454/R4455 and R4456/R4457 control the gain of the signals output from pins 8 and 10, which are applied to the speakers.

The values of R4458/C4454 and R4459/C4455 provide stability at high frequency under load conditions.

IC4451 is powered from the +25v supply, which is applied to pin 9 via R4467.

This supply is monitored by Q4452 stage.

Should a short circuit exist on pin 9 of IC4451, the base voltage of Q4452 will fall, and the transistor will conduct. The voltage appearing at the collector will then be applied to the gate of Q704 on the power supply and deflection panel. This places the T.V. into its standby mode (described later), and the +9v and +25v supplies will be removed.

Should the load conditions of IC4451 suddenly increase, the +25v supply can drop in value. Should this fall below 22v, the voltage supplied to the junction of R4462/R4463 via ZD4001 will disappear.

As a result the base voltage of Q951 will drop. This transistor controls the regulation of the power supply, and therefore increases the power supply drives to compensate for the fall in the +25v due to load conditions.

The left and right audio signals can also be output to external equipment via the two scart sockets AV1 or AV2.

The audio signals input to pins 35 and 34 of IC1401 are output at pins 16 and 17. These are then input to pins 1 and 3 of AV1.

The audio signals output from pins 7 and 26 of IC402 are input to pins 1 and 3 of AV2 via transistors Q441 and Q442.

When the mute command is received, pin 38 of IC001 will output a "High". As a result, Q4451 is turned on and applies a "Low" to pin 3 of IC4451 via R4453. This ensures that no sound will be output for as long as the mute condition exists.

Under no signal conditions, the clock and data signals input to IC402 at pins 16 and 17 will cause the I.C. to mute its output stages.

When the T.V. is switched off, and the +9v begins to fall, the emitter voltage of Q443 on the Anti-Pop sub board will become more positive than the base, due to the charge maintained by C442. The transistor will then conduct and applies a voltage to the base of Q444 and Q445. The transistors then turn on, pulling "Low" the left and right signals at the junctions of C438/C473 and C446/C472. This action ensures no spurious sound is input to IC4451 during the time it takes for the +9v supply to disappear from switch off.

Similarly, when the 11v supply drops from switch off, Q4454 on the Mute sub board will conduct, and applies a voltage to Q4451, which then turns on and pulls pin 3 of IC4451 "Low", therefore muting the sound output during the switch off period.

DOLBY and Effects Processing Panel

IC4600 is the DOLBY PRO LOGIC decoder I.C. The left and right channels from IC402 on the signal and control panel are applied to pins 8 and 9 of IC4600. In PRO LOGIC mode (DOLBY processing), this I.C. outputs 4 channels, i.e. Left, Right, Centre, and Surround.

In "PHANTOM" mode, the I.C. only outputs 3 channels, i.e. Left, Right, and Surround.

In PRO LOGIC mode the surround channel contains identical information, which is fed to both left and right surround speakers.

IC4600 has to be informed when to output 4 or 3 channels. This is done by applying a "Low" or "High" to pin 4. This is obtained from the sub-audio amp panel, and depends on the speaker configuration and the position of the "MODE" switch (SW4901) on the back of the T.V.

When SW4901 is set for PRO LOGIC mode (with or without the centre speaker connected), the voltage at the junction of R4922/R4940 is pulled low, and as a result Q4904 turns OFF. Q4902 will then turn on, and applies the required "Low" to pin 4 of IC4600.

When "PHANTOM" mode is selected using SW4901, and the centre speaker disconnected, Q4904 base becomes "High" via R4927, R4922, and turns on. This pulls "Low" the base of Q4902, turning it off, and applying the required "High" to pin 4 of IC4600 from the potential network of R4928/R4929.

In PRO LOGIC mode, the left and right front channels are output from pins 32 and 30 of IC4600, and applied to pins 28 and 30 of IC4604.

They emerge from pins 24 and 9, and are then returned to IC402 on the signal and control panel for further processing.

The surround channel is fed from pin 29 of IC4600 to pin 5 of IC4605.

In PRO LOGIC mode, pin 2 of IC4604 (microprocessor controlled output line) is held "Low". This is applied to pin 9 of IC4605, and as a result, the switching network outputs the surround channel from pin 4. It is then input to IC4601 for the required 20m Seconds delay, 7KHz low pass filtering, and modified DOLBY "B" noise reduction, before finally emerging from pin 56. It is then applied to pin 5 of IC4610. The "Low" at pin 2 of IC4604 is applied to pin 9 of IC4610 via D4601, and as a result, the switching network outputs the surround channel at pin 4.

It is then input to pin 10 of IC4604, then emerges at pin 15 after volume, bass and treble processing. It is then input to pin 12 of IC4610, and due to the "Low" at pin 2 of IC4604 being applied to pin 11 of IC4610, the surround channel is output at pin 14.

It is then input to IC4604 at pin 3, then fed internally to both the left and right headphone channels of the headphone channel stage.

NOTE: This stage is called the headphone channel because it was originally intended for that purpose. In our application however, we use it for the surround channel, so this should not be confused with the genuine headphone output of IC402 on the signal and control panel.

The surround channel is output at pins 20 and 13 of IC4604, then applied to IC4902 on the audio sub-amplifier panel for further amplification. The full circuit description of this panel will be given later.

The centre channel is output from pin 31 of IC4600, and applied to pin 23 of IC4604. It then receives volume, bass and treble processing, before emerging at pin 18.

The processed centre channel is then applied to IC4901 on the audio sub-amplifier panel.

MATRIX/HALL mode

The left and right audio signal from IC402 of the signal and control panel are input to IC4600 at pins 8 and 9.

In the HALL and MATRIX modes, IC4600 is only used to generate the centre channel, which is simply the left + right. This signal is output at pin 31, then input to IC4604 at pin 23 for volume, bass and treble processing. It is then output from pin 18 and applied to IC4901 on the sub-amplifier panel as the centre channel.

The left and right audio signals from IC402, are also applied to pins 3 and 1 of IC4605.

Pin 2 of IC4604 becomes "High" during HALL and MATRIX modes, and this is applied to pin 9 of IC4605, causing the left and right signals to emerge at pins 4 and 15 respectively. They are then input to IC4601 at pins 61 and 60 for processing.

In MATRIX mode, pin 31 of IC4604 is "High", and this is applied to Q4604, turning it on. Consequently, Q4605 will be turned off, and effectively pin 1 of IC4601 will become open circuit. Under this condition the I.C. will process the signals in the left - right mode of operation.

In HALL mode, pin 31 of IC4604 is "Low". Therefore, Q4604 will turn off, and Q4605 on. A "Low" is then applied to pin 1 of IC4601, and the I.C. will process the signals in the left + right mode of operation.

In summary:- MATRIX = the left and right difference output

HALL = the left and right sum output

For description purposes, the HALL and MATRIX output will now be called the delayed channel, but remember each one is different in reality.

During HALL and MATRIX modes, the switching condition of IC4610 results in a "High" being output from pin 15. This is applied to pin 46 of IC4601, and disables the DOLBY noise reduction operation.

The delayed signal output from pin 54 of IC4601, is returned to pin 63 via C4648, R4616, R4615 etc. This is the feedback line to obtain the required reverb (Echo) effect.

In MATRIX mode, the delayed signal output from pin 56 is applied to pin 3 of IC4608 via R4648. It is amplified, output at pin 1, then input to pin 3 of IC4610. In MATRIX mode, both pins 2 and 31 of IC4604 will be "High". This means that pin 9 of IC4610 becomes "High" via R4653. Therefore, the switching condition of IC4610 causes the delayed signal at pin 3 to be output from pin 4.

In HALL mode, the delayed signal is input to pin 5 of IC4610. The "Low" at pin 31 of IC4604 is applied to pin 9 of IC4610 via D4602, and causes the switching to output the delayed signal at pin 4.

Therefore, pin 4 of IC4610 is the common output for both HALL and MATRIX modes.

For the left surround channel, the signal at pin 4 of IC4610 is returned to pin 13, then switched to pin 14. It is then input to pin 3 of IC4604 for volume control, then output at pin 20. It is then applied to IC4902 on the sub-amplifier panel.

For the right surround channel, the signal at pin 4 of IC4610 is input to pin 6 of IC4608 via R4652. It is then inverted, output from pin 7, then input to pin 5 of IC4604 for volume control.

An output is then produced at pin 13, which is applied to IC4902 on the sub-amplifier panel.

The front left and right channel signal path of the delayed HALL and MATRIX signal is as follows:-

The left channel from IC402 on the signal and control panel is fed via R4663, R4632 and applied to pin 3 of IC4606. The delayed channel from pin 54 of IC4601 is also applied to pin 3 via R4634. These resistors form a summing junction, so the left channel is added to the delayed channel.

The right channel from IC402 is fed via R4633 to pin 5 of IC4606. The delayed signal from IC4601 is fed to the invertor IC4607 via R4635, then this is also added to pin 5 of IC4606 via R4642.

The complete front left and front right channels are output from pins 1 and 7 of IC4606 respectively, then input to pins 1 and 32 of IC4604. They are then output from pins 24 and 9, and returned to IC402 on the signal and control panel.

NOISE SEQUENCER OPERATION

To set up the speaker output levels to suit the acoustics of the room, a noise sequencer is incorporated into this panel. This outputs white noise on each of the channels in turn, so the customer can set each output level to suit. This ensures optimum results during the DOLBY Pro Logic operation.

When the noise sequence mode is selected from the on-screen menus, pin 3 of IC4602 goes "High", and pin 5 goes "Low". Q4606 is turned on, and applies a "Low" to pin 11 of IC4605, changing the internal switching of IC4605, so that the "Low" applied to pin 12 from pin 5 of IC4602, is output from pin 14, and applied to pin 1 of IC4600.

"High" and/or "Low" outputs are obtained from pin 6 and 7 of IC4602, and applied to pins 2 and 3 of IC4600. These determine the sequence of white noise from each channel.

SUB-AUDIO PANEL

This panel is used to amplify the left and right suround channels, and the centre channel. It also provides a bass output which is applied to the woofer speaker.

The left and right surround channels are input to E4601 at pins 4 and 7 respectively from the DOLBY panel. They are then fed via C4991 and C4993 on the mute panel, and applied to pins 1 and 5 of IC4902 via C4909 and C4922.

The zener and capacitor on pins 1 and 5 give input protection to the I.C.

The amplified left channel is output from pin 10 of IC4902, whilst the right channel is output from pin 8.

Feedback to control the gain of each channel is obtained from these outputs. Feedback for the left channel is applied to pin 2 via R4910/R4911, and C4910, whilst feedback for the right channel is applied to pin 4 via R4907/R4909, and C4921.

The outputs from pin 10 and 8, are then applied to the left and right surround speakers via C4911 and C4920.

The centre channel is input to E4601 at pin 3 from the DOLBY panel, and applied via C4992 on the mute panel, then via divider R4916/R4917 and C4914, to pin 1 of IC4901.

The bass signal is derived from the left and right audio signals obtained from the signal and control panel. These are input to pins 1 and 3 of PL4902, added, divided, and low pass filtered by R4914, R4913, R4915 and C4925, with the resultant signal applied to pin 5 of IC4901 via C4901.

IC4901 operates exactly as IC4902, providing a centre channel output from pin 10, which is applied to the centre speaker via C4912, and a bass output from pin 8, which is applied to the bass (woofer) speaker via C4903.

If no centre speaker is connected, and the mode switch SW4901 is set to Pro Logic mode, then the left and right speakers of the T.V. (PL4905 and PL4906) will supply the centre channel.

If no external left and right speakers are connected, and the mode switch is set to Phantom, then the left and right speakers of the T.V. (PL4905 and PL4906) will supply the left and right outputs. These are obtained from the left and right outputs of IC4451 on the signal and control panel, and input via PL4903.

Depending on the speaker configuration and the position of SW4901, Q4904 and Q4902 will provide a "High" or "Low" output for the DOLBY panel via E4601 pin 6. This operation is explained in the DOLBY panel description.

There are two mute circuits on this sub-audio panel:-

The first mute circuit affects the feedback inputs of IC4901 and IC4902.

During switch ON or OFF, pin 38 of IC001 on the signal and control panel will momentarily output a "High"

Q4451 will then turn on, applying a "Low" to R4476, consequently turning on Q4455. This will then apply a "Low" to Q4901 on the sub-amp panel via PL4902 pin 5 and R4946.

Q4901 then turns on, and its collecter will go "High". This is applied to the feedback lines of IC4901 via R4941 and R4942, and the feedback lines of IC4902 via R4943 and R4944. In this way the amplifiers are muted.

The second mute circuit affects the inputs to the sub-audio panel, and consists of Q4991, Q4992 and Q4993.

During switch OFF, the +9v used to supply Q443 base disappears. Q443 will then turn ON for a short time, due to the charge remaining in C442. A voltage is then applied to Q4991, Q4992 and Q4993 via pin 5 of E4601, turning the transistors ON. The collectors of these transistors are then pulled "Low", thereby suppressing the centre and surround channels during the initial switch OFF mode.

Luminance stages:

The composite video output from pin 12 of the I.F. assembly unit, is applied to the base of Q321. The signal at the emitter is then input to pin 36 of IC1401 via R1314, and also to pin 19 of AV1 socket via C304 and R306 as an output to external equipment.

This signal at Q321 emitter is also input to pin 1 of IC320 via Q4453, and produces a "Low" ouput at pin 5, which is used as the "IDENT" for pin 11 of IC001. This presence of this "IDENT" halts the search tuning process.

The composite video input to pin 36 of IC1401 is output from pin 19 for luminance processing, and pin 21 for chrominance processing.

A composite video signal is also output from pin 30. This is then fed via Q1310 to pin 19 of AV2 socket. It can then be output to external equipment attached to this socket if desired.

The video signal from pin 19 of IC1401 is then fed via Q1399 into pin 12 of the teletext decoder unit. The output from this unit is applied to buffer Q2011, then fed to the base of Q505 via R558, with CP501 performing 4.43MHz rejection. It is then input to pin 30 of the luminance processor IC3201 via delay line DL502 and Q3202. The input at pin 30 then passes through an internal dynamic noise reduction stage, whose operation is controlled by the voltage level at pin 29. This in turn is controlled by a "High" or "Low" output from pin 8 of IC001, which then turns Q3209 on or off, therefore changing the voltage level at pin 29 of IC3201.

The signal with or without noise reduction, then emerges at pin 28, and is input once more to a black level correction circuit at pin 26 via C3216. This stage enhances the signal by making the darkest part of the signal even darker. For this operation, horizontal and vertical pulses are required. These are input to the sync. separation stage at pin 20 of the I.C. via D3203 and D3202 respectively.

In order for the sync. separation stage to function correctly, the D.C. level of the video signal needs to be regenerated and input to pin 18 of IC3201. This is accomplished by Q3100 and Q3101 stages.

The processed signal is then output from pin 23 of the I.C., then input once again at pin 15, via buffer Q3205 and C3221.

The internal circuitry then produces a time compressed profile compensation signal, which is split into 2. One signal is output at pin 7, whilst the other is internally processed to provide shoot balance and sharpness control, then output from pin 11.

The sharpness can be varied by the voltage applied to pin 6 of IC3201.

This variable voltage is obtained from pin 5 of IC001, and is then fed via R020, ZD3244, and R3203 to pin 6 of IC3201.

The video output from pin 7 of IC3201 is fed to Q501, where it is mixed with the processed signal from pin 11, fed via Q503, Q504, and Q502 stages.

The resultant signal is then input to pin 7 of IC501 where it is processed and added to the R.G.B. signals.

Contrast and brightness control is obtained by the variable voltage levels applied to pins 14 and 25 of IC501. These originate from pins 2 and 3 of IC001.

An automatic beam current limit circuit is employed on this chassis.

Beam current is sampled at pin 4 of the flyback transformer, and applied to the cathode of D709 via R722. Should the beam current rise, the voltage level will fall, and the diode will conduct. This drop in voltage is then fed via R721 to pin 14 of IC501. This reduces the contrast level and hence the beam current is also reduced.

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Chrominance Stages:

The composite video signal from pin 21 of IC1401 is fed via a bandpass filter circuit consisting of R547, C588 and L504. This extracts the chrominance signal, which is then input to pin 19 of IC501 via C507.

The chrominance signal is then applied to an internal A.C.C. amplifier, the operation of which depends on the burst signal amplitude, and the saturation voltage level on pin 18.

The oscillator X502 connected to pin 22, regenerates the required 4.43MHz sub carrier frequency, with phase control being determined by the components connected to pin 23.

The chrominance signal output from pin 17 is fed via the delay line DL501, then re-enters the I.C. at pin 15.

The decoding, adding and subtracting of the direct and delayed colour signals is performed internally, producing the R-Y, G-Y, and B-Y signals. These are then added to the luminance signal in a matrix circuit to produce the red, green, and blue signals. These finally emerge from pins 26, 29, and 4 respectively.

External inputs:

When inputs such as VCR signals are applied to AV1 or AV2 socket, the video signal from that socket is applied to pin 12 or pin 3 of IC1401, and the left and right audio signals to pins 10 and 11, or pins 2 and 4.

When equipment having an equivalent 21 pin socket is connected to the AV sockets and switched on, a "High" will be output from pin 8 of the appropriate socket, and applied to pin 34 or 37 of IC001.

The clock and data outputs from pins 40 and 41 of IC001 will then change, and this change is applied to pins 32 and 33 of IC1401. This causes the internal switching network of IC1401 to change, so that the external video signals are output from pins 19 and 21, and the left and right audio signals from pins 22 and 23 of the IC. They are then processed as previously described for the T.V. signal.

If the external equipment does not have an equivalent connector, the external mode must be selected using the remote control handset. This will then change the clock and data signal to suit accordingly.

When S-VHS equipment is connected to AV2 socket, the luminance signal is applied to pin 3 of IC1401, and the chrominance signal is applied to pin 5.

The video signal (luminance) will still be output from pin 19 as previously described, but pin 21 will now output the chrominance signal. These signals then follow the same luminance and chrominance paths described for T.V. signals.

When camcorder inputs etc. are applied via the phono sockets, the external mode must be selected using the TV/AV button on the handset. This then causes a change in the clock and data inputs applied to pins 32 and 33 of IC1401, so that the camcorder audio and video signals input to pins 13, 14, and 15, are output for further processing.

When S-VHS equipment is connected via the 5 pin socket on the front of the T.V., a "Low" is applied to pin 36 of IC001.

When the TV/AV button of handset is then pressed, the clock and data commands change the internal switching of IC1401 once again, so that the luminance and chrominance signals applied to pins 7 and 9 are output from pins 19 and 21 for further processing.

When R.G.B. equipment such as computers are connected to AV1 socket, the red, green, and blue inputs, plus a fast blanking input, are applied to pins 1, 4, 6, and 8 of IC502 respectively.

The external R.G.B. signals are output from pins 16, 13 and 11. These are then applied to pins 28, 2 and 5 of IC501. The fast blanking is output from pin 9 of IC502 and applied to pin 24 of IC501, changing the operation of the I.C., so that only the external R.G.B. signals emerge from pins 26, 29 and 4.

Horizontal and vertical timebase:

IC501 provides sync. separation, Horizontal and vertical timebase and output stages, and also contains a vertical count-down stage.

Sync. separation is obtained using the video signal input at pin 10.

The horizontal frequency is obtained from X501, connected to pin 9. It is then applied internally to a divider/count-down circuit from which the vertical frequency is obtained. Using this method has the advantage that no external frequency adjustment controls are required.

The horizontal output is made available from pin 13, and the vertical output from pin 12.

A horizontal signal from the flyback transformer is applied to pin 6 of IC591. It is then output from pin 7, and input to pin 8 of IC501. This pin supplies a comparitor circuit, which compares the horizontal signal to the sync. signal. Any frequency difference causes a corrective output to be applied to the horizontal oscillator stage, thereby maintaining the desired phase relationship.

A line flyback signal is also applied to pin 11 of IC501 via VR502, providing manual shift control.

Deflection output stages:

The horizontal output from pin 13 of IC501 is applied to pin 3 of IC591. This I.C. acts as a non-inverting buffer, and the horizontal output is obtained from pin 1.

It is then applied to line drive transistor Q701 on the power and deflection panel. T702 couples the output from Q701 to line output transistor Q702. Both these transistors are powered by the H.T. voltage supply (146v).

A line pulse available at pin 1 of the flyback transformer is rectified by D702, and supplies approximately 180v to power the output transistors of the C.R.T. base.

Under certain fault conditions, i.e. increased H.T. or reduced value of the tuning capacitors C706/C723 etc., an excess of E.H.T. could be developed.

To prevent this happening, the rectified voltage of D702 is fed via the potential divider R718/R719 to ZD701. Should the E.H.T. rise excessively, the threshold voltage of the zener will be exceeded and it will conduct, applying a voltage to the gate of thyristor Q704, turning it on, and pulling "Low" its anode.

This "Low" is applied to Q952 via R960 and R959, turning it off, and consequently turning Q953 and Q956 off also.

The +9v and +25v supplies are then removed, causing the timebase stages of IC501 to become non-operational, therefore preventing further E.H.T. generation until the fault is removed.

R705 monitors the current of the horizontal output stages. Should a short circuit condition exist, the increased voltage drop across R705 will cause Q703 to conduct. A voltage will then be applied to the gate of Q704 via R708 and R717, turning it on, and removing the E.H.T. generation as previously explained.

The vertical output from pin 12 of IC501 is input to pin 2 of IC601 via R618. This is then applied to an internal ramp generation circuit, which in conjunction with C602 on pin 6 of IC601, produces a sawtooth waveform at vertical frequency.

Flyback generation time is determined by D601 and C603 connected between pins 8 and 9 of IC601.

The vertical output for the deflection coils is obtained from pin 12 of IC601.

The deflection current that occurs at the junction of C606/R611, is added to the feedback obtained from R609/C605, and the result is input to pin 7 of IC601 to control linearity, with VR601 determining the vertical amplitude.

Vertical shift can be obtained by the setting of S601.

Q602 stage monitors the +25v supply. Should the supply rise or fall, the change in base voltage will cause a variation of the collector voltage, and this change is applied to pin 7 of IC601 via R606 and VR601. The amplitude of the vertical output is then altered, compensating for the original fluctuation in voltage.

A portion of the ramp generation signal at pin 6 is shaped by Q601/Q603 stage then applied to the East/West correction circuitry of IC751 on the power and deflection panel.

This I.C. type TEA2031A provides the necessary correction needed for the scan circuits when employing 110° cathode ray tubes. It is powered by the voltage applied to pin 6, which is obtained from pin 1 of the Flyback transformer, and rectified by D752 and smoothed by C758.

The signal from Q601/Q603 stage is applied to pin 1 of IC751, which feeds an internal comparitor circuit. This compares the current available at pin 1 to the current at pin 2, and in conjunction with the load resistor R757, produces a symmetrical parabola waveform at pin 7 when both currents are equal. Adjusting VR755 changes the current at pin 2, causing the parabola to become assymmetrical, thus producing a keystone correction effect.

Line pulses from pin 1 of the Flyback transformer, are fed to pin 8 of IC751 via R760, VR751 and the integrating components D751/C756. This sets the line width, with VR751 providing variable width control.

The complete correction waveform is output from pin 5, with VR752 providing parabolic correction control. It is then applied to the diode modulation circuitry of Q702 stage via L751.

A portion of the beam current available at pin 4 of the Flyback transformer, is applied to pin 7 of IC751 via C750, R753.

This provides some correction for the breathing effect that can occur during sudden changes in brightness etc.

Power supply circuit:

This T.V. contains two power supplies.

The main power supply is a self oscillating supply, with a variable frequency and pulse width. The sub-supply operates at a fixed frequency with a variable pulse width.

Main Power Supply:

The A.C. supply is rectified by D901 - 04, producing approximately 300v to power Q903.
Current flowing through R901/R909 causes Q903 to initially turn on.

Secondary voltages are then induced in T901, and a feedback voltage obtained via D905, L903 etc. is applied to the base of Q903, maintaining the transistors operation.

This circuit self oscillates at a frequency determined by the inductance of the transformer, the A.C. mains voltage, and the load conditions etc.

The transistor Q902 is held at –ve potential to ensure a good turn off of Q903 stage. The diodes D954 and D955 across the base and emitter of Q903 offer protection.

The secondary voltage in winding S1/S2 is rectified by D951 to produce the H.T. voltage of 146v. This is smoothed by C952.

Winding S3/S4 produces approximately 12v via D952, which is smoothed by C954. This 12v is then applied to Q953 stage, which in conjunction with IC951, produces the +9v chassis supply.

The rectified voltage from D953 is smoothed by C960. It is then fed to Q956, producing the +25 volts required for the sound output stage.

The voltage rectified by D953, is also fed via R967 to IC005 on the tuning and control circuit. This produces the +5v required for IC001.

Q951 stage controls H.T. regulation. The base voltage of Q951 is set to a pre-determined level by the resistor network R952, VR951 and R963. During normal operation, R951 is effectively out of circuit due to Q954 being turned on.

The emitter of Q951 is effectively held at 6v9 by ZD951. Should the H.T. level rise, the base voltage will become more positive than the emitter, and this difference is amplified by the transistor and applied to OPTO-COUPLER IC901. An output is then produced from IC901 and applied to the transistor network of Q901/Q902. This stage controls the on-time of Q903, and therefore controls the H.T. level, hence maintaining H.T. regulation.

ZD953 (shown connected at the emitter of Q703 on the circuit), offers protection to the H.T. circuits should this H.T. level rise excessively.

Q957 protects the +9v and +25v supplies during short circuit conditions.

Should either supply rail go short circuit, the base of Q957 will become "Low" via D956, R968, or D967, R970, and as a result the transistor turns on, applying a voltage to the gate of thyristor Q704. This turns on, and applies a "Low" to Q952, consequently turning off Q953 and Q956, removing the supplies that generate the +9v and +25v.

When the standby command is transmitted from the handset, pin 17 of IC001 becomes "High". This is applied to Q011 base, turning the transistor on.

This applies a "Low" to Q952 base via R960, turning the transistor off. As a result, both Q956 and Q953 become non-operational, and consequently the +9v and +25v chassis supplies are removed.

Due to the +9v supply disappearing, the drive to IC902 is removed. Q904 then operates, and causes the primary of T901 to enter its burst firing mode every 50Hz cycle. Q904 does this by following the mains cycle via R914, terminating Q903 operation every 10m Seconds.

This ensures a low power consumption during standby.

Finally, during standby, the voltage to the base of Q954 is removed, and the transistor turns off. As a result, R951 is added to the potential divider network at the base of Q951. This alters the drive to opto-coupler IC901, and the result is to reduce the H.T. voltage during the no load conditions created during standby.

Sub-Power Supply:

From switch on, the AC voltage is rectified by bridge rectifier D9001-D9004, producing approximately 300v DC at C9002. This is applied to Q9000 collector via the primary winding of T9000.

The voltage at pin 7 of IC9000 will rise to approximately 16v via R9000 and D9005. This allows the internal circuitry to create a sawtooth waveform, from which a squarewave output is obtained at pin 6. This output causes F.E.T. Q9002 to turn off and on.

The base current for Q9000 is obtained from the DC supply to pin 7 of IC9000.

This DC supply is maintained after initial start up by the feedback obtained from the bias winding of T9000, which is then fed via R9001, L9001 and D9006 to pin 7.

ZD9000 and D9010 are protection diodes, preventing the voltage levels from rising to a point where they may cause damage to IC9000 and Q9000/Q9002 stages.

A current sense circuit exists at pin 3 of IC9000, and is used to monitor primary current. A voltage proportional to the primary current is obtained across R9005, then applied to pin 3 via R9007, R9008. C9005 suppresses the leading edge of this waveform to remove any switching noise that may occur.

This voltage is compared to an internal reference of approximately 0.8v. Should the voltage applied to pin 3 rise above this reference, the pulse width output from pin 6 is limited, therefore providing protection for the transistors Q9000 and Q9002.

R9023, C9013 and D9011 act as a soft start circuit. This limits the duty cycle from pin 6 during the initial start up period, allowing a gradual rise to full output.

Q9001 monitors the base drive voltage to Q9000. Should this voltage fail, Q9001 will turn on, and in conjunction with the internal error amp. at pin 1 of IC9000 limits the maximum current, therby protecting Q9000 stage.

Overvoltage is sensed on the primary by the bias winding, then fed to pin 2 of IC9000 via R9001, L9001, D9013, and R9021. If the voltage at pin 2 rises above the internal reference voltage, the output from pin 6 is limited by the internal error amp., therefore clamping the secondary voltage to a safe level.

There are two supply voltages derived from the secondary of T9000.

A +24 volts is obtained from D9100 and smoothed by C9100, whilst a +12v supply is obtained from D9101 and smoothed by C9101.

A regulation circuit ensures the +12v supply remains stabilised.

Should the +12v rise, the voltage applied to IC9100 via R9103 will increase, and once it exceeds an internal reference, IC9100 will conduct, thus turning the OPTO-COUPLER on. This causes a decrease to the error amp. input level at pin 1 of IC9000, reducing the pulse width output of the I.C., thus offsetting the original rise in the +12v supply.

When the standby condition exists, the +9v from the main power supply disappears. As a result the voltage to the base of Q9101 is removed, and the transistor turns off. Q9100 will then turn on due to the voltage supplied via D9103 and R9110, and consequently, the OPTO-COUPLER remains permanently on. Pin 1 of IC9000 is therefore held at a low potential, and no output will exist from pin 6. As a result the secondary supplies of +24v and +12v are removed for as long as the standby condition exists.

During this standby mode, the voltage supply for the OPTO-COUPLER is obtained from R967 on the main power supply. It is then fed via PL4902 on the sub-audio panel to +5v regulator IC4903, then from PL4904 to D9103 on the sub-power supply, then via R9106 to pin 1 of the OPTO-COUPLER.

Remote control and selection circuit:

The remote control receiving unit U001, contains an infra red amplifier. This is powered by the +5v supply fed via R058.

The signal output from pin 2 of U001 is then applied to pin 35 of IC001 via R059.

This I.C. performs channel selection, customer control adjustments, on-screen displays, search tuning, teletext selection, and controls the switching functions of IC1401.

IC002 is the memory I.C., which stores the data relating to the above functions, then transfers that information to IC001 when required.

Both of these I.Cs. are powered by the +5v supply.

X001, C018 and C019, supply IC001 with a basic clock frequency, which controls all operating functions of the I.C.

From switch on IC001 must be initially reset. This is performed by IC004.

As the +5v rises from switch on, pin 3 of IC004 is held "Low". This is applied to pin 33 of IC001, thus resetting the I.C.

Once pin 1 of IC004 has almost reached its +5v potential, the "Low" at pin 3 is removed. Pin 33 of IC001 will then become "High" via R057, thus releasing the reset condition.

Should a sudden drop in voltage occur, the reset circuit may not be fast enough to follow it, and the initial reset conditions of IC001 could be affected.

To prevent this happening, Q008 and Q009 stages have been added to monitor the +9v supply.

Under normal conditions, Q008 remains off, and therefore Q009 is also off. However, should the +9v fall, the emitter of Q008 will maintain its voltage due to the charge held by C009, but the base voltage will drop. Q008 will then conduct and applies a voltage to Q009 via R022 and ZD004. Q009 then turns on, and pulls pin 33 of IC001 "Low", thereby resetting the I.C.

When the +9v rises again, Q008 and Q009 will turn off once more, and the reset condition will be released.

Pin 17 of IC001 outputs a "Low" when the T.V. is switched on. This is applied to Q011, turning the transistor off. A "High" is then applied to Q952 base on the power supply panel via R097, R960, and R959.

This turns the transistor on, applying a "Low" to R957 and ZD906, thereby turning on Q956 and Q953. The +9v and 25v supplies required to operate the chassis are then made available.

When search tuning is initiated, the clock and data outputs applied to the tuner from pins 40 and 41 of IC001 cause the tuning procedure to commence.

Once a broadcast has been located, the video signal from pin 12 of the I.F. assembly unit is input to pin 1 of IC320 via Q321 and Q4453.

The output from pin 5 of IC320 then goes "Low", and this is applied to pin 11 of IC001 as an "IDENT" signal, causing the I.C. to halt the tuning procedure. IC001 will then monitor the AFC input at pin 9 to obtain the optimum signal.

Whilst searching for a signal, pin 5 of IC320 remains "High". This turns Q322 on, which pulls low the input to pin 36 of IC1401, causing the T.V. screen to remain blank during the search routine.

All customer control levels such as brightness and contrast etc., are determined by outputs from IC001. The volume and balance outputs to the headphones (which can be set by the customer), are controlled by the clock and data outputs from pins 40 and 41.

When the on-timer is set, and the T.V. has been placed into its standby mode, the output from pin 18 of IC001 will alternate between "High" and "Low". This causes Q012 to turn off and on alternately. This action turns the light emitting diode D019 off and on, thereby giving an indication that the timer mode is in operation.

The outputs from pins 19 and 20 of IC001 are determined by the type of sound received.

When a NICAM stereo broadcast is being received, both these pins go "Low" and therefore both D020 and D021 will illluminate.

Should the transmission authorities broadcast a dual language programme, only one diode will light up. This will depend on which of the dual languages are chosen, using the remote control handset.

When a mono broadcast exists, both pins 19 and 20 will become "High", therefore, D020 and D021 will remain off.

The clock and data outputs to operate the Tuner, NICAM assembly, Teletext assembly, IC402 and IC1401, are obtained from pins 40 and 41 of IC001.

The red, green and blue outputs for the on-screen displays, are made available from pins 22, 23, and 24 respectively, with a blanking signal from pin 25. The components L003, C016, and C017 determine the oscillating frequency of the display. The horizontal and vertical inputs at pins 26 and 27 of IC001, determine the actual position of the display on the screen.

To prevent any interference occurring between the on-screen display inputs and the luminance signal input at pin 7 of IC501, Q010 and Q013 have been added. When an on-screen command is received, the blanking output from pin 25 of IC001 will be applied to the base of Q013 via emitter follower Q010, turning the transistor on, thus removing the Luminance input at pin 7 of IC501.

When the standby command is received by IC001, the "Low" at pin 17 will be removed. A "High" is then applied to Q011 base via R040, turning the transistor on.

The collector will then become "Low", and consequently, Q952 on the power supply will be turned off.

As a result, both Q953 and Q956 will turn off, thereby removing the +9v and +25v supplies. This shuts down the sound output I.C., and the deflection timebase stages, placing the T.V. into its standby condition.

Should a PAL 60 transmission be received, there will be a change in the potential at pin 7 of IC001. This is applied to pin 5 of the vertical output I.C. via R621, correcting the scan to maintain a consistent height.

Teletext circuit:

The three I.Cs. which control the teletext operations are IC2201 type CF72306, IC2202 type CF72307, and IC2210 type TMS4464-10L.

The basic operation of these I.Cs. are as follows:-

IC2201.....Data slicer IC2202.....Decoder

IC2210.....Memory (256k byte)

The data and clock signals from pins 40 and 41 of IC001, are input to IC2202 at pins 36 and 37, and R.G.B. teletext signals are output from pins 20, 18 and 16.

During teletext mode, a "High" is output from pin 15 of IC2202 and applied via IC502, to IC501 pin 24 as the fast blanking signal. This alters the internal switching of IC501, so that only the teletext R.G.B. signals input to pins 28, 2, and 5 of IC501, are output to the C.R.T. base transistors.

This "High" applied to IC502 also changes the internal switching, so that the R.G.B. inputs at pins 3, 5, and 7 are output from pins 16, 13, and 11.

IC2203 performs the reset operation for IC2202 when the T.V. is first switched on, or brought out of its standby condition.

Until the voltage at pin 1 of IC2203 reaches 4v5, pin 3 remains "Low", and this is applied to pin 29 of IC2202, initiating the reset condition. When pin 1 exceeds 4v5, the "Low" is removed from pin 3, and pin 29 of IC2202 becomes "High" via R2209, releasing the reset condition.

The crystal X2201 provides the required oscillator for IC2201, and from this a clock output is made available at pin 15. This is then input to pin 9 of IC2202.

IC2201 has two main functions. The first is to acquire the teletext information.

The video signal from pin 19 of IC1401 is input to the teletext panel, and applied to pins 2 and 3 of IC2201.

From this, teletext clock and data signals are obtained, and output from pins 12 and 13, then input to pins 11 and 12 of IC2202.

The video signal is also input to pin 25 of IC2202, then output from pin 26. This signal is returned to the chassis for luminance processing during normal T.V. operation.

The second function is to supply a composite sync. signal.

The video input to IC2201 at pins 2 and 3, produces a sync. signal from pin 19, which is then input to pin 3 of IC2022.

IC2210 is the memory control, which stores and retrieves all relevant data required for operating and storing favourite pages etc.

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PICTURE AND CONTROL ADJUSTMENTS

AGC Adjustment:
1. Switch T.V. on and allow to warm up for at least two minutes.
2. Receive a signal with a level of -47dBm.
3. Connect a voltmeter to the AGC terminal of tuner, i.e. +ve leg of C103.
4. Adjust variable control at top of I.F. unit (see adjustment position drawings) until meter reads 6v8 +/- 0v1.

HT Adjustment:
1. Switch T.V. on, receive Philips circle test pattern, and set contrast and brightness levels to maximum.
2. Connect a voltmeter to the +ve leg of C701.
3. Adjust VR951 so that meter reads 146v +/- 0v2.

Horizontal Phase:
1. Receive Philips circle test pattern.
2. Adjust VR502 to centralise picture.

Vertical Center:
1. Receive Philips circle test pattern.
2. Set contrast and brightness levels to maximum.
3. Operate S601 (3 position switch) until the center of circle is at the mechanical center of screen.

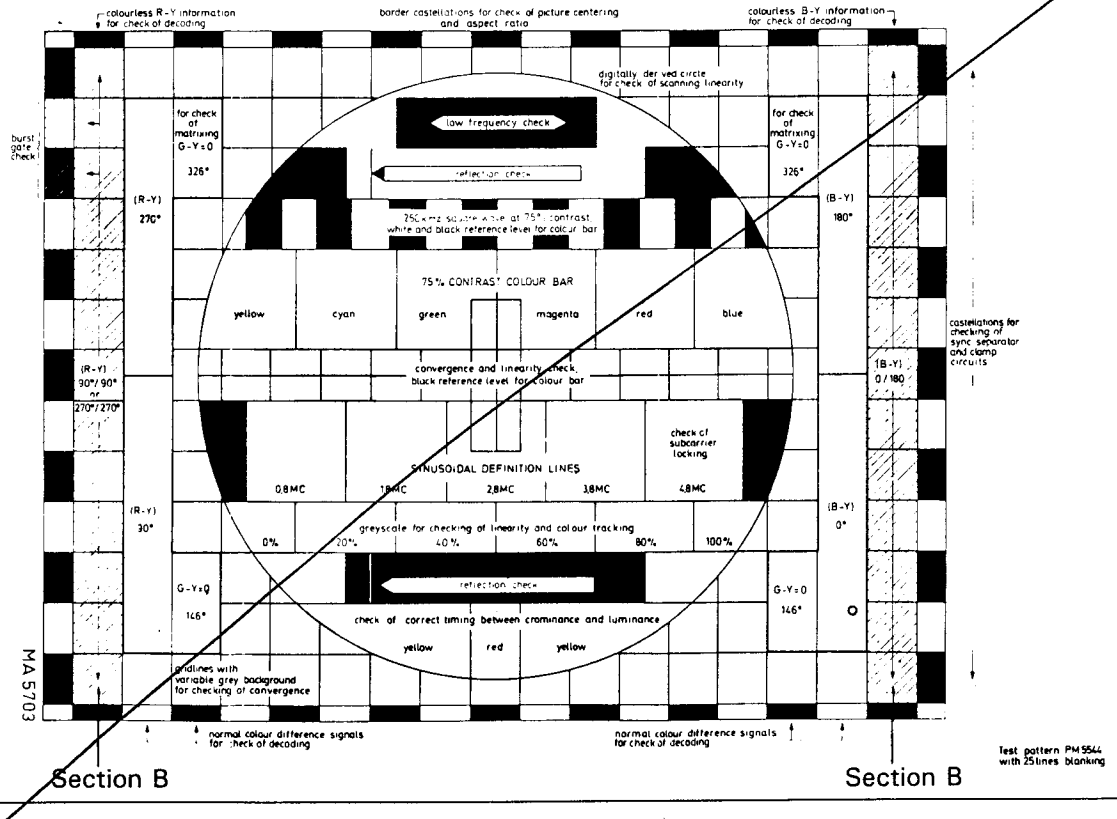
Vertical Height Adjustment:
1. Receive Philips test pattern.
2. Set contrast and brightness levels to maximum.
3. Adjust VR601 to obtain the desired picture height.

Pin Cushion Adjustment
1. Receive Philips test pattern.
2. Set contrast and brightness to obtain normal viewing levels.
3. Adjust VR755 so that the vertical lines at outside edges of screen are as perpendicular as possible.
4. Adjust VR752 to improve the vertical lines so they become as perpendicular as the vertical lines at the centre of the screen.
5. Adjust VR751 so that the castellations at each side of the screen just disappear from view.
6. Repeat this procedure until the optimum result is achieved.

Focus Adjustment:
1. Receive Philips circle test pattern setting colour level to minimum, and contrast and brightness levels to maximum.
2. Adjust contrast so that the first two bars of the colour bar display become black.
3. Adjust brightness so that the 3rd and 4th bars of the grey scale bar display are the same colour black as in step 2.
4. Adjust the focus control (upper control on flyback transformer) to obtain the best overall focus.

Delay Line Adjustment:
1. Receive Philips circle test pattern, and set colour adjustment to achieve normal viewing level.
2. Adjust VR501 to minimise venetian blind effect in section "B" of the test card as shown below.
3. Next adjust L501A to minimise the venetian blind effect in the magenta portion of circle pattern.
4. Repeat steps 2 and 3 for the best overall result.

COMPOSITION OF TEST CARD PROVIDED BY PHILIPS PM5544



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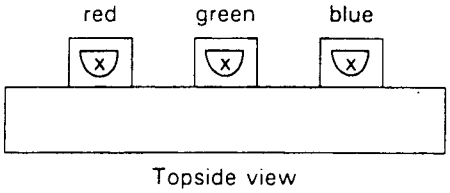
CUT OFF AND SCREEN ADJUSTMENT

PREPARATION:

(i) Preset the red, green and blue background controls on the C.R.T. base to the positions shown.



Topside view

01

(ii) Set the customer controls as follows:- Contrast = 0
Colour = 0
Brightness = Approx. mid point

(iii) Receive horizontal white line, or red raster pattern from a Philips pattern generator.

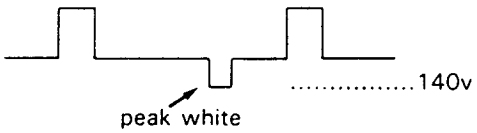
METHOD:

1. Adjust screen control on the flyback transformer until the horizontal line is just visible and its colour can be seen.

2. Do not touch the background control of the colour that is most prominent on the screen, but adjust the other two background controls until a reasonable white line is obtained.

3. Connect an oscilloscope probe to each of the R.G.B. cathodes in turn and leave connected to the one with the highest level.

4. Set customer brightness so that the cathode value is no greater than 140v as shown below.



02

5. Disconnect oscilloscope, and set screen control so that the white horizontal line is just visible once more.

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WHITE BALANCE

PREPARATION:

(i) Set the customer controls as follows:- Contrast = 0
Colour = 0
Brightness = Approx. mid point

(ii) Receive the white raster pattern.

(iii) Obtain and set up a combined colour analyser and light meter, e.g. MINOLTA CA100.

METHOD:

1. Adjust brightness customer control so that the light output from the white raster reads Y = 1 → 2 cdm^{-2} on the light meter.

2. Next adjust the red and blue background controls to obtain the colour chromaticity co-ordinates of
x = 283 y = 299.

The above co-ordinates represent a colour temperature of 9300k

PROTECTION CHECKS

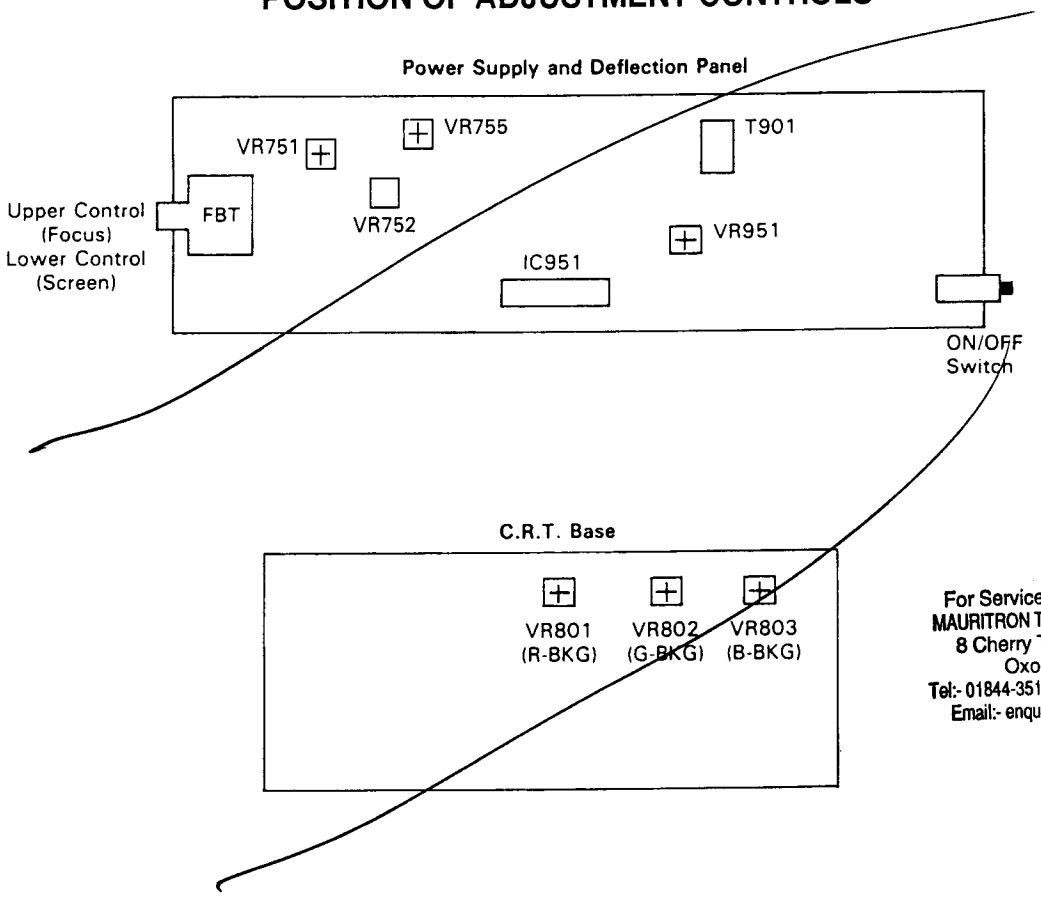
High Voltage Limit Check:

1. Switch T.V. on and set contrast and brightness levels to maximum.
2. Connect a 470K resistor in parallel with R718/R718A, and ensure that picture and sound disappear instantly.
3. Switch T.V. off, remove resistor, and wait 10 - 15 seconds.
4. Switch T.V. on again, check that normal operation is resumed. Return contrast and brightness levels to their original settings.

Anode/Focus s/c Check:

1. Switch T.V. on and set contrast and brightness levels to maximum.
2. Connect a 390R (20 - 30 Watt) resistor from pin 9 of the flyback transformer to ground.
3. Check that picture and sound disappear instantly.
4. Switch T.V. off, remove resistor, and wait 10 - 15 seconds.
5. Switch T.V. on again, and check that normal operation is resumed, then return contrast and brightness levels to their original settings.

POSITION OF ADJUSTMENT CONTROLS



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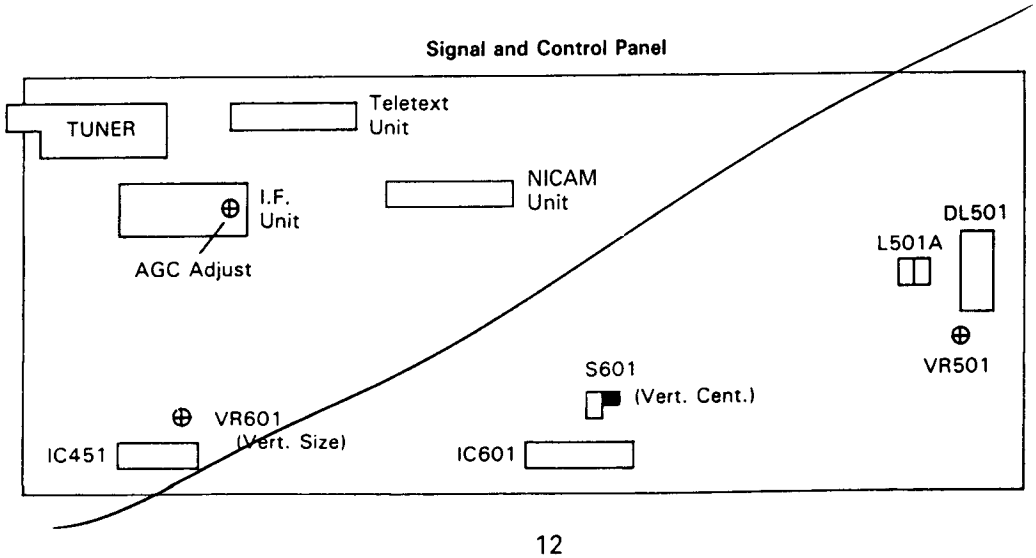
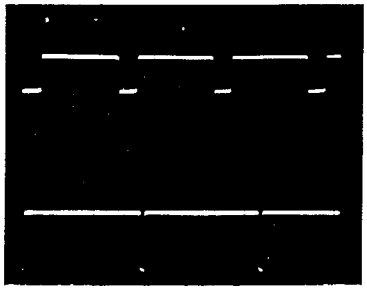


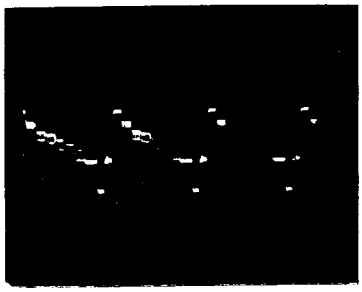
SOME WAVEFORMS FOR C2574TN, C2874TN. THESE WERE TAKEN ON A COLOUR BAR SIGNAL, USING AN OSCILLOSCOPE SET TO 20μ SECS/CM UNLESS OTHERWISE STATED, AND A 10:1 PROBE

IC001
pin 26
6v0 p.p.

IC001
pin 27
4v0 p.p.
at 0.5m sec/cm

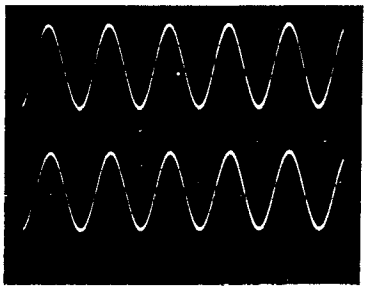


IC320
pin 1
2v2 p.p.



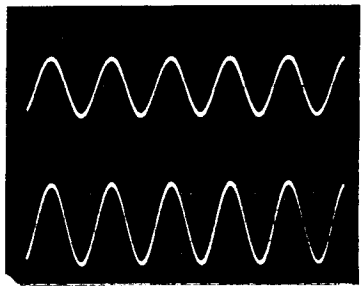
IC402
pins 3 and 7
3v0 p.p.
at 0.5m sec/cm

IC402
pins 5 and 9
3v0 p.p.
at 0.5m sec/cm



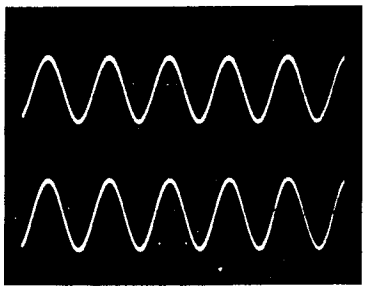
IC402
pin 10
2v0 p.p.
at 0.5m sec/cm

IC402
pin 13
2v6 p.p.
at 0.5m sec/cm
Headphone volume at maximum



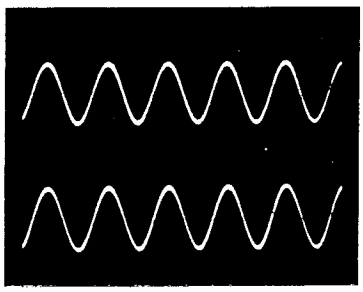
IC402
pin 15
1v0 p.p.
at 0.5m sec/cm
Volume at maximum

IC402
pin 18
1v3 p.p.
at 0.5m sec/cm
Volurne at maximum



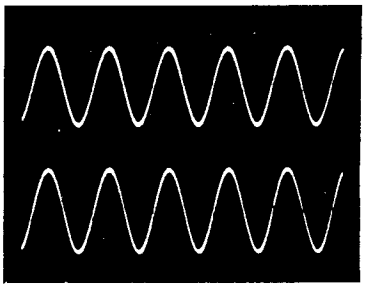
IC402
pin 20
2v0 p.p.
at 0.5m sec/cm
Headphone volume at maximum

IC402
pin 23
2v0 p.p.
at 0.5m sec/cm



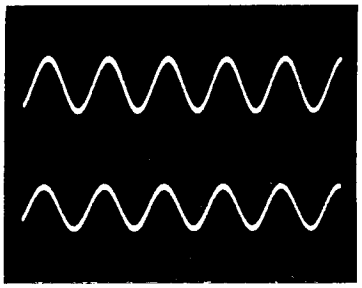
IC402
pin 24
3v0 p.p.
at 0.5m sec/cm

IC402
pin 26
3v0 p.p.
at 0.5m sec/cm



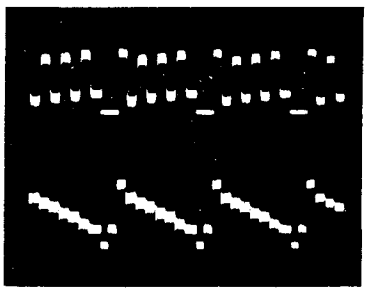
IC402
pin 27
0v2 p.p.
at 0.5m sec/cm

IC402
pin 29
0v15 p.p.
at 0.5m sec/cm



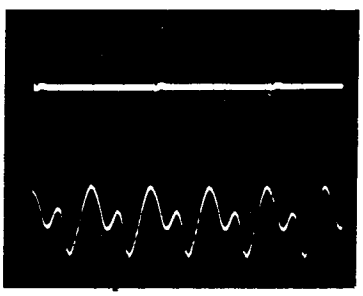
IC501
pin 4
4v5 p.p.

IC501
pin 7
0v6 p.p.



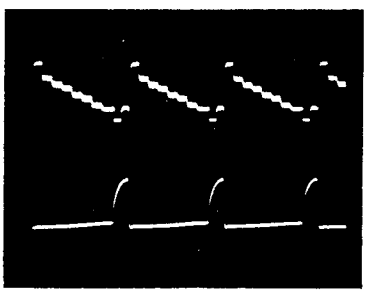
IC501
pin 8
0v25 p.p.
at 0.5m sec/cm

IC501
pin 9
0v5 p.p.
at 1μ sec/cm



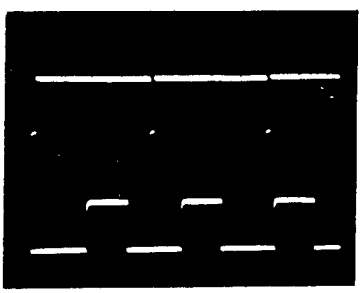
IC501
pin 10
2v0 p.p.

IC501
pin 11
0v9 p.p.

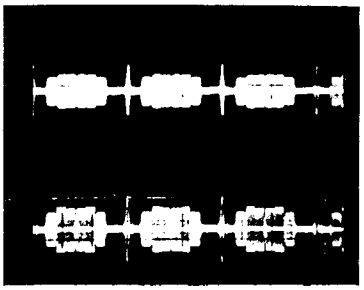


IC501
pin 12
3v7 p.p.
at 0.5m sec/cm

IC501
pin 13
7v5 p.p.

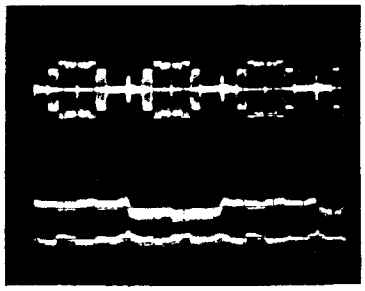


IC501
pin 15
0v4 p.p.



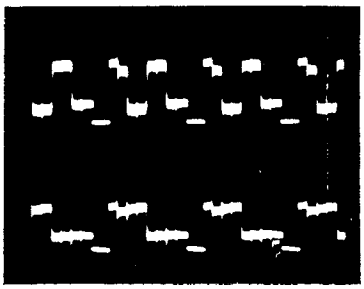
IC501
pin 17
2v2 p.p.

IC501
pin 19
1v0 p.p.



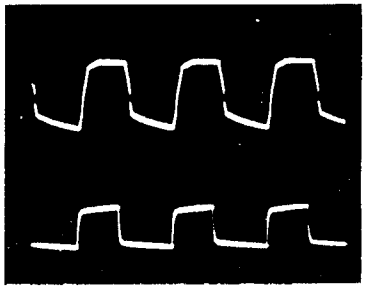
IC501
pin 22
0v08 p.p.

IC501
pin 26
4v2 p.p.



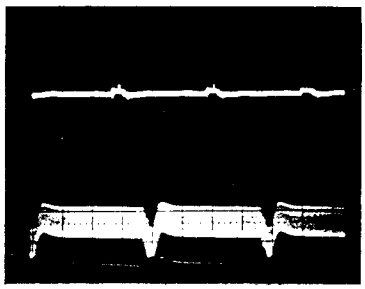
IC501
pin 29
4v0 p.p.

IC591
pin 1
5v0 p.p.



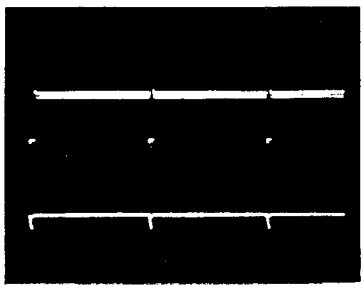
IC591
pin 3
8v0 p.p.

IC591
pin 6
0v25 p.p.



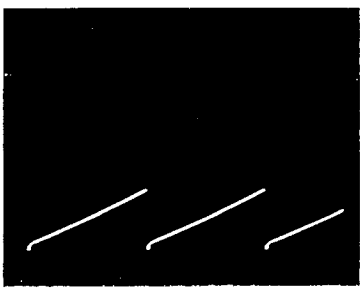
IC591
pin 7
0v5 p.p.

IC601
pin 2
4v0 p.p.
at 0.5m sec/cm

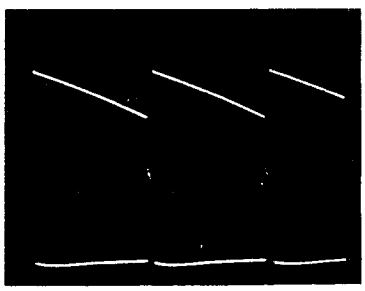


IC601
pin 3
2v0 p.p.
at 0.5m sec/cm

IC601
pin 6
2v0 p.p.
at 0.5m sec/cm

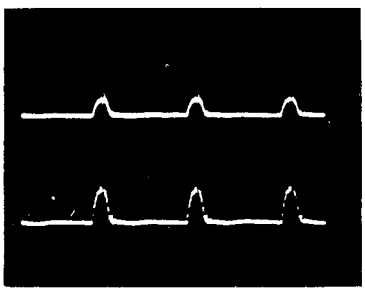


IC601
pin 7
1v5 p.p.
at 0.5m sec/cm



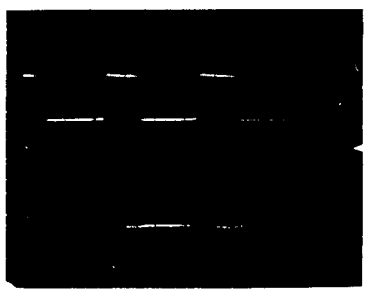
IC601
pin 13
32v p.p.
at 0.5m sec/cm

IC751
pin 1
1v0 p.p.



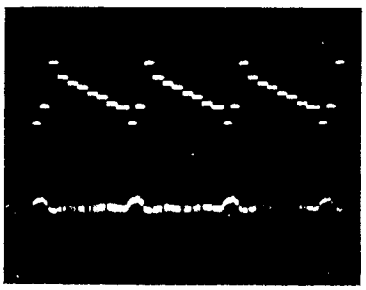
IC751
pin 2
1v8 p.p.

IC751
pin 5
35v p.p.



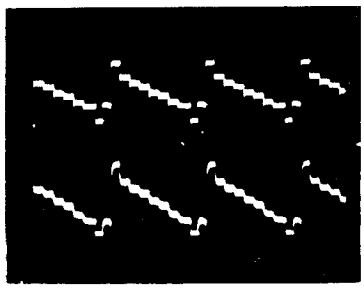
IC751
pin 7
0v5 p.p.

IC3201
pin 7
2v0 p.p.



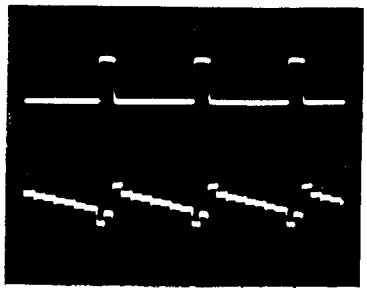
IC3201
pin 11
0v04 p.p.

IC3201
pin 15
1v0 p.p.



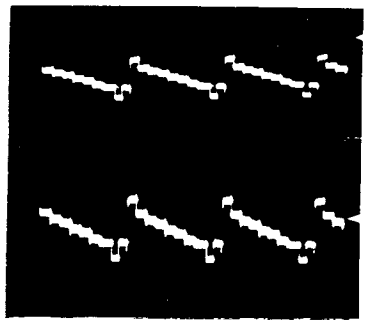
IC3201
pin 18
1v5 p.p.

IC3201
pin 20
2v5 p.p.



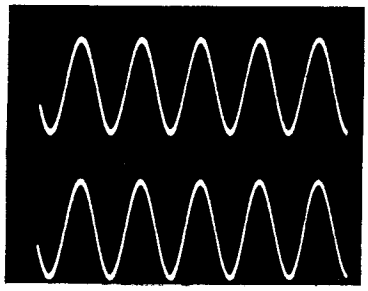
IC3201
pin 23
0v7 p.p.

IC3201
pin 26
0v7 p.p.



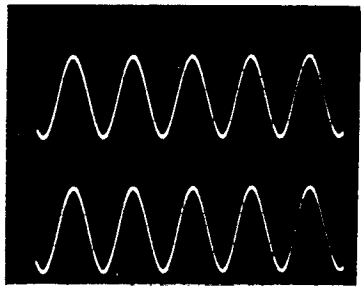
IC3201
pin 30
1v1 p.p.

IC4451
pin 1
0v8 p.p.
at 0.5m sec/cm
Volume at maximum



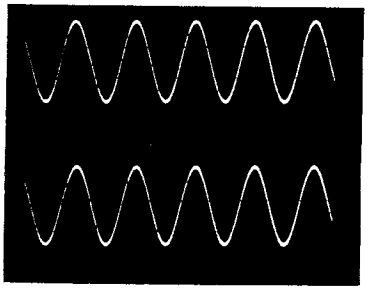
IC4451
pin 5
0v8 p.p.
at 0.5m sec/cm
Volume at maximum

IC4451
pin 8
28v p.p.
at 0.5m sec/cm
Volume at maximum



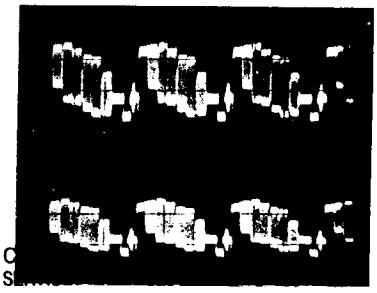
IC4451
pin 10
28v p.p.
at 0.5m sec/cm
Volume at maximum

IC1401
pin 16
2v5 p.p.
at 0.5m sec/cm



IC1401
pin 17
2v5 p.p.
at 0.5m sec/cm

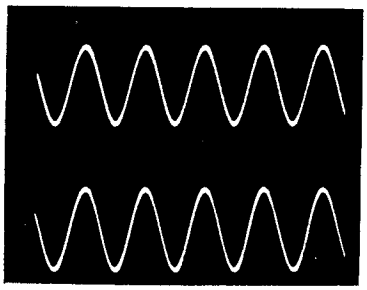
IC1401
pin 19
2v8 p.p.



IC1401
pin 21
2v0 p.p.

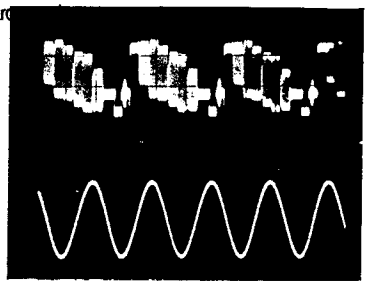
For Service Manuals C
MAURITRON TECHNICAL S
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritr

IC1401
pin 22
2v5 p.p.
at 0.5m sec/cm



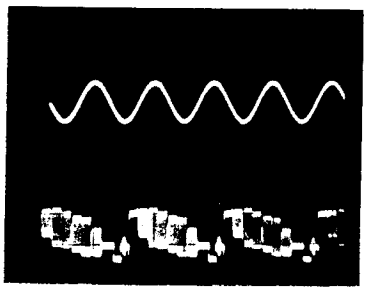
IC1401
pin 23
2v5 p.p.
at 0.5m sec/cm

IC1401
pin 30
2v5 p.p.



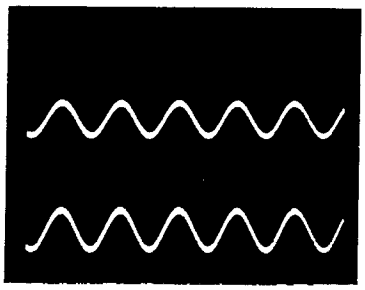
IC1401
pin 34
2v5 p.p.
at 0.5m sec/cm

IC1401
pin 35
2v5 p.p.
at 0.5m sec/cm



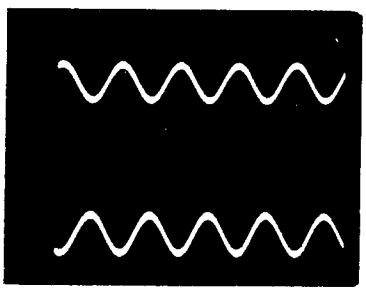
IC1401
pin 36
1v0 p.p.

IC4600
pin 8
1v5 p.p.
at 0.5m sec/cm



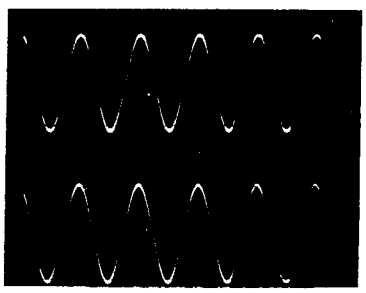
IC4600
pin 9
1v5 p.p.
at 0.5m sec/cm

IC4600
pin 30
1v5 p.p.
at 0.5m sec/cm



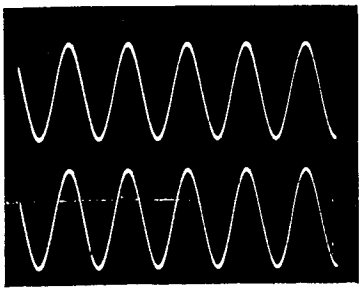
IC4600
pin 32
1v5 p.p.
at 0.5m sec/cm

IC4604
pin 1
1v5 p.p.
at 0.5m sec/cm



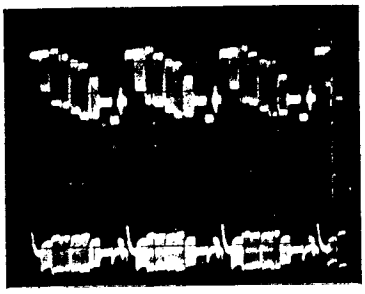
IC4604
pin 3
1v5 p.p.
at 0.5m sec/cm

IC4604
pin 5
2v1 p.p.
at 0.5m sec/cm



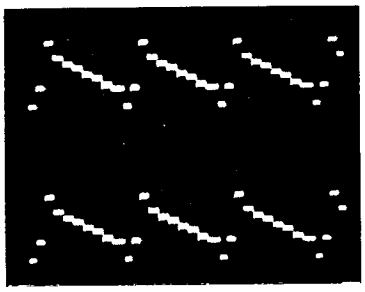
IC4604
pin 9
2v1 p.p.
at 0.5m sec/cm

Q322
base
0v7 p.p.



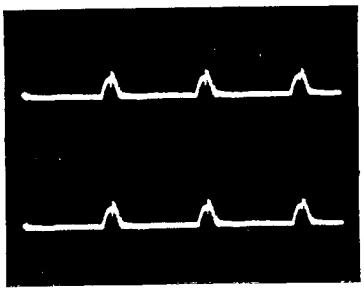
Q322
collector
1v7 p.p.

Q505
base
2v2 p.p.



Q505
emitter
2v2 p.p.

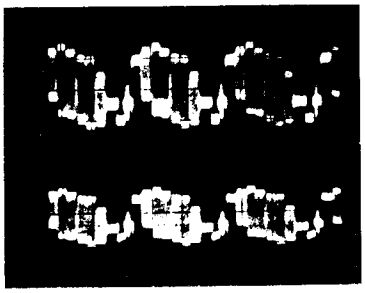
Q602
base
1v5 p.p.
at 0.5m sec/cm



Q602
collector
1v5 p.p.
at 0.5m sec/cm

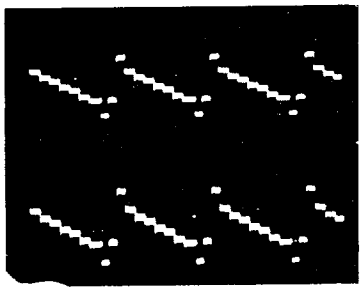
Q603
emitter
2v2 p.p.
at 0.5m sec/cm

Q321
base
0v15 p.p.



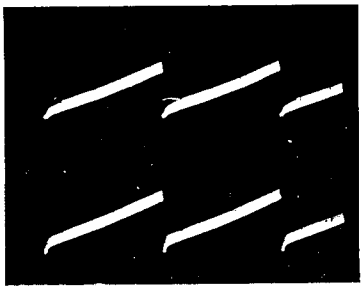
Q321
emitter
0v09µ p.p.

Q501
base
2v1 p.p.



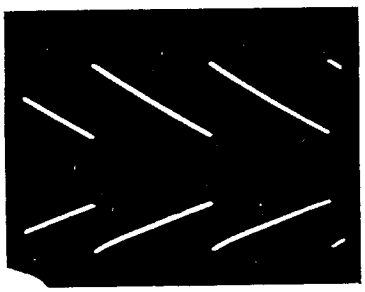
Q501
emitter
1v3 p.p.

Q601
base
2v0 p.p.
at 0.5m sec/cm



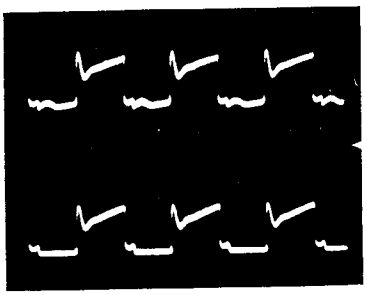
Q601
emitter
2v0 p.p.
at 0.5m sec/cm

Q603
collector
2v6 p.p.
at 0.5m sec/cm



Q603
base
2v0 p.p.
at 0.5m sec/cm

Q701
collector
70v p.p.



Q701
base
2v0 p.p.

For Service Manuals Contact
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Email:- enquiries@mauritron.co.uk

VOLTAGE MEASUREMENTS

These voltages were taken on a colour bar signal, using a 20kΩ/volt meter, with colour, contrast and colour set to give normal viewing levels.

SIGNAL BOARD ICs

IC001 ST6 (MICRO)

Pin	Volts	Pin	Volts	Pin	Volts	Pin	Volts
1	not used	11	0v1 (4v4)	20	3v8 (0v1)	35	4v8
2	0v2 - 4v5		(no sig.)		(stereo)	36	5v0
	(cont.)	12	0v	21	0v	37	0v
3	0v2 - 4v2	13	5v0 (0v)	22	0v	38	0v
	(bri.)		(prog -)	23	0v	39	5v0
4	0v2 - 4v9	14	5v0 (0v)	24	0v	40	3v7
	(col.)		(prog +)	25	0v (4v6)	41	3v7
5	0v - 5v0	15	5v0 (0v)		(no sig.)	42	5v0
	(sharp.)		(vol +)	26	3v6		
6	not used	16	5v0 (0v)	27	4v2		
7	0v (5v0)		(vol -)	28	4v5		
	(pal 60)	17	0v (4v3)	29	4v6		
8	5v0 (0v)		(standby)	30	0v		
	(N Reduce ON)	18	5v1 (0v1)	31	*		
9	5v0 (2v7)		(standby)	32	2v6		
	(AFC on)	19	3v8 (0v1)	33	5v0		
10	0v		(stereo)	34	0v		

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* trips out when touched

IC002 ST24C16

Pin	Volts	Pin	Volts
1	0v	5	3v7
2	0v	6	3v7
3	0v	7	0v
4	0v	8	5v1

IC005 7805

Pin	Volts
1	27v
2	0v
3	5v1

IC121 7812

Pin	Volts
1	14v7
2	0v
3	12v2

IC320 TDA9120

Pin	Volts	Pin	Volts
1	4v4	5	0v1
2	0v	6	not used
3	not used	7	0v
4	4v8	8	12v2

IC402 TDA9860

Pin	Volts	Pin	Volts	Pin	Volts
1	not used	12	4v0	23	4v0
2	not used	13	4v0	24	4v0
3	4v0	14	4v0	25	0v
4	7v9	15	4v0	26	4v0
5	4v0	16	3v7	27	4v0
6	8v0	17	3v7	28	not used
7	4v0	18	4v0	29	4v0
8	0v	19	4v0	30	not used
9	4v0	20	4v0	31	not used
10	4v0	21	4v0	32	not used
11	4v0	22	4v0		

IC481 TDA2822M

Pin	Volts	Pin	Volts
1	2v4	5	0v6
2	5v7	6	0v
3	2v4	7	0v
4	0v	8	0v6

IC501 STV2100

Pin	Volts	Pin	Volts	Pin	Volts
1	6v5	12	4v2	21	6v0 (3v3)
2	2v9	13	4v4	22	3v7
3	8v7	14	1v4 - 3v0	23	4v6
4	2v6		(cont.)	24	0v1 (1v0)
5	2v8	15	2v2	25	1v0 - 2v6
6	6v5	16	0v		(bri.)
7	2v8 (0v)	17	4v3	26	2v8
8	4v4	18	1v5 - 4v6	27	6v4
9	2v1		(col.)	28	3v2
10	1v3	19	2v7	29	2v8
11	0v	20	3v6 (0v)	30	8v8

IC502 TEA5114A

Pin	Volts	Pin	Volts
1	3v4	9	0v1 (1v0)
2	0v	10	0v1 (1v0)
3	3v4	11	2v8
4	3v5	12	0v1 (1v0)
5	3v5	13	2v8
6	3v5	14	8v7
7	3v5	15	0v1 (1v0)
8	0v	16	2v8

() = Text

() = no signal

IC591 BA4458			
Pin	Volts	Pin	Volts
1	4v3	5	4v3
2	3v6	6	4v3
3	4v4	7	4v3
4	0v	8	8v8

IC601 LA7838			
Pin	Volts	Pin	Volts
1	8v5	8	26v8
2	3v8	9	3v0
3	4v2	10	1v2
4	4v3	11	0v
5	0v	12	14v4
6	4v2	13	27v5
7	3v9		

IC1401 TA8777N							
Pin	Volts	Pin	Volts	Pin	Volts	Pin	Volts
1	10v3	10	6v3	19	4v5	28	5v9
2	6v2	11	6v3	20	0v	29	8v4
3	5v9	12	5v9	21	4v5	30	4v2 (3v2)
4	6v3	13	6v3	22	5v0	31	0v
5	5v9	14	6v3	23	5v0	32	3v7
6	6v3	15	5v9	24	—	33	3v7
7	5v9	16	5v0	25	—	34	6v3
8	6v3	17	5v0	26	—	35	6v3
9	5v9	18	0v	27	4v0	36	5v9

() = no signal

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IC3201 HA11559NT					
Pin	Volts	Pin	Volts	Pin	Volts
1	8v4	11	3v0	21	0v
2	8v8	12	5v2	22	not used
3	3v4	13	6v0	23	5v1
4	4v5	14	4v9	24	5v6
5	6v0	15	3v8	25	not used
6	4v2	16	4v2	26	3v5
7	5v2 (4v8)	17	4v2	27	0v
8	1v3	8	6v6	28	5v5
9	not used	19	5v9	29	0v9
10	3v8	20	0v5	30	4v1

() = no signal

IC4451 TDA7263			
Pin	Volts	Pin	Volts
1	1v6	7	0v
2	1v6	8	14v8
3	16v6	9	30v1
4	1v6	0	14v8
5	1v6	11	not used
6	0v		

SIGNAL BOARD TRANSISTORS

	Q003	Q004	Q008	Q009	Q010	Q011
C	0v	0v	3v0	4v0	8v8	3v9 (0v1)
B	1v5 - 4v6 colour	5v0	8v8	0v	0v	0v (4v3)
E	0v	5v0	8v8	0v	0v	0v (0v)

() = standby

	Q012	Q013	Q121	Q321	Q322	Q441
C	0v (0v)	2v8	7v1	6v9	2v1 (0v1)	8v6
B	5v0 (0v2)	0v	5v5	4v2	0v1 (0v7)	4v0
E	4v1 (0v9)	0v	4v9	3v5	0v	3v4

() = standby

() = no signal

	Q442	Q443	Q444	Q445	Q501	Q502
C	8v6	0v	0v	0v	8v4	8v4
B	4v0	8v1	0v	0v	4v1	4v1
E	3v4	8v5	0v	0v	3v4	3v4

	Q503	Q504	Q505	Q601	Q602	Q603
C	0v9	0v9	8v8	8v9	4v3	6v4
B	6v0	6v0	3v1	4v0	0v7	2v2
E	6v6	6v6	2v5	3v3	0v2	1v6

	Q804	Q1310	Q1320	Q1321	Q1399	Q3100
C	0v1	4v9 (3v9)	0v5	0v5	8v6	8v3
B	8v9	4v2 (3v2)	1v1	1v1	4v5	3v1
E	8v6	0v	5v9	5v8	3v8	2v5

() = no signal

	Q3101	Q3202	Q3205	Q3209	Q4451	Q4452
C	4v0	8v3	5v7	0v (3v8)	6v6	0v
B	3v3	1v2	5v0	4v3 (0v)	0v2	28v
E	0v	0v6	0v	0v	0v	28v

() = Noise Reduction on

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	Q4454	Q4455	Q2011
C	0v2	26v8	5v3
B	11v5	3v5	3v8 (3v3)
E	11v4	3v9	3v1 (2v7)

() = teletext

DOLBY BOARD ICs

In the following tables, L = Left , R = Right, C = Centre, S = Surround

IC4600 LA2700N					
Pin	Volts	Pin	Volts	Pin	Volts
1	4v9 HALL/MATRIX	10	0v8	22	9v5
	3v1 DOLBY mode	11	5v8	23	9v5
	0v1 noise gen.	12	5v8	24	5v8
2	0v noise gen. L/R	13	5v8	25	5v8
	5v0 other modes	14	9v6	26	5v8
3	0v noise gen. C/L	15	9v6	27	11v8
	5v0 other modes	16	5v8	28	5v8
4	4v3 PHANTOM (SW4901)	17	5v8	29	5v8
	0v PRO LOGIC (SW4901)	18	5v7	30	5v8
5	0v DOLBY mode	19	5v7 OFF mode	31	5v8
	5v other modes		3v7 other modes	32	5v8
6	5v8	20	5v7 OFF mode	33	5v8
7	5v8		3v7 other modes	34	5v5
8	5v8	21	5v7 OFF mode	35	0v1
9	5v8		3v7 other modes	36	1v8

IC4601 LV1000NA

Pin	Volts	Pin	Volts	Pin	Volts	Pin	Volts
1	0v HALL/OFF 9v other modes	16	6v0	32	4v3	47	6v2 DOLBY+OFF 9v0 other modes
		17	6v0	33	0v		
2	11v6	18	not used	34	2v5	48	5v9
3	3v6	19	11v8	35	2v0	49	5v9
4	3v7	20	not used	36	2v1	50	5v9
5	5v9	21	not used	37	2v5	51	5v9
6	5v9	22	not used	38	2v5	52	5v9
7	6v0	23	not used	39	2v1	53	5v9
8	3v8	24	not used	40	1v3	54	6v1
9	3v8	25	5v0	41	2v6	55	6v0
10	3v8	26	2v5	42	2v6	56	6v0
11	6v0	27	2v5	43	not used	57	5v9
12	5v9	28	2v5	44	not used	58	5v9
13	5v8	29	1v3	45	not used	59	0v
14	3v7	30	3v8	46	11v2	60	5v9
15	3v6	31	2v4		6v2 DOLBY+OFF		

IC4602 SAA1300

Pin	Volts	Pin	Volts
1	0v	6	0v noise C/S
2	5v0		5v0 other modes
3	0v DOLBY mode 5v0 other modes	7	0v noise L/R 5v0 other modes
4	5v0 DOLBY mode 0v other modes	8	3v7
		9	3v7
5	0v DOLBY mode 5v0 other modes		

IC4603 KM4164

Pin	Volts	Pin	Volts
1	4v3	9	1v3
2	2v4	10	2v1
3	3v8	11	2v5
4	1v3	12	2v5
5	2v5	13	2v1
6	2v5	14	2v0
7	2v5	15	2v5
8	5v0	16	0v

IC4604 TDA9860

Pin	Volts	Pin	Volts	Pin	Volts
1	4v0	12	4v0	24	4v0
2	0v2 DOLBY+OFF 6v8 other	13	4v0	25	8v1
		14	4v0	26	not used
3	4v0	15	4v0	27	4v0
4	8v0	16	3v7	28	4v0
5	4v0	17	3v7	29	4v0
6	8v1	18	4v0	30	4v0
7	not used	19	4v0	31	0v2 DOLBY+OFF 6v7 other
8	0v0	20	4v0		
9	4v0	21	4v0	32	4v0
10	4v0	22	4v0		
11	4v0	23	4v0		

IC4605 HCF4053BE

Pin	Volts	Pin	Volts
1	5v0	11	11v9 DOLBY 0v other
2	5v0		
3	5v0	12	0v DOLBY 5v other
4	5v0		
5	5v0	13	3v1
6	0v	14	3v1 DOLBY 0v1 noise gen 4v9 other
7	0v		
8	0v		
9	0v2 DOLBY 6v8 other	15	5v0
		16	11v9
10	0v2 DOLBY 6v8 other		

IC4606 BA4558

Pin	Volts	Pin	Volts
1	6v0	5	5v9
2	6v0	6	6v0
3	5v9	7	5v9
4	0v	8	11v9

IC4607 BA4558

Pin	Volts	Pin	Volts
1	5v9	5	5v9
2	5v9	6	6v0
3	6v0	7	6v0
4	0v	8	11v9

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IC4608 BA4558

Pin	Volts	Pin	Volts
1	6v0	5	6v0
2	6v0	6	5v9
3	5v9	7	5v9
4	0v	8	11v9

IC4610 HCF4053BE

Pin	Volts	Pin	Volts
1	11v9 DOLBY 11v5 other	10	0v2 DOLBY+OFF 6v8 other
2	not used	11	0v2 DOLBY+OFF 6v8 other
3	6v0		
4	5v9	12	5v9
5	5v9	13	5v9
6	0v	14	5v9
7	0v	15	6v2 DOLBY+OFF 11v5 other
8	0v		
9	0v7	16	11v9

IC4611 7805

Pin	Volts
1	11v8
2	0v
3	5v0

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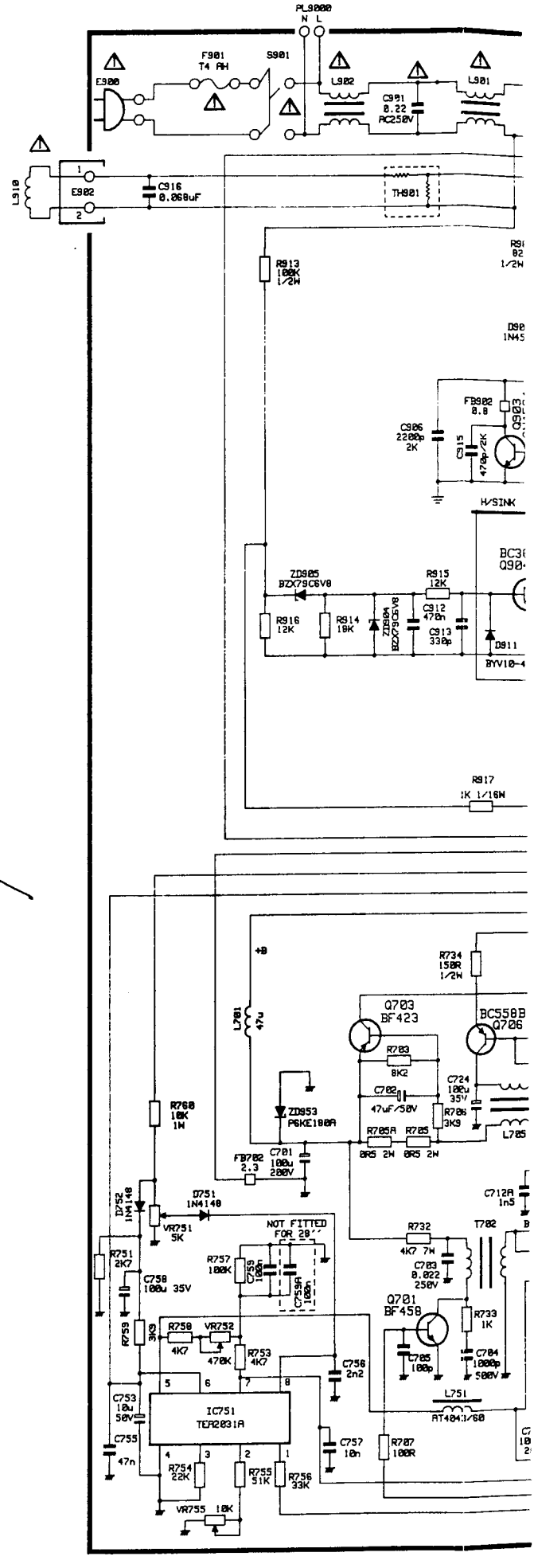

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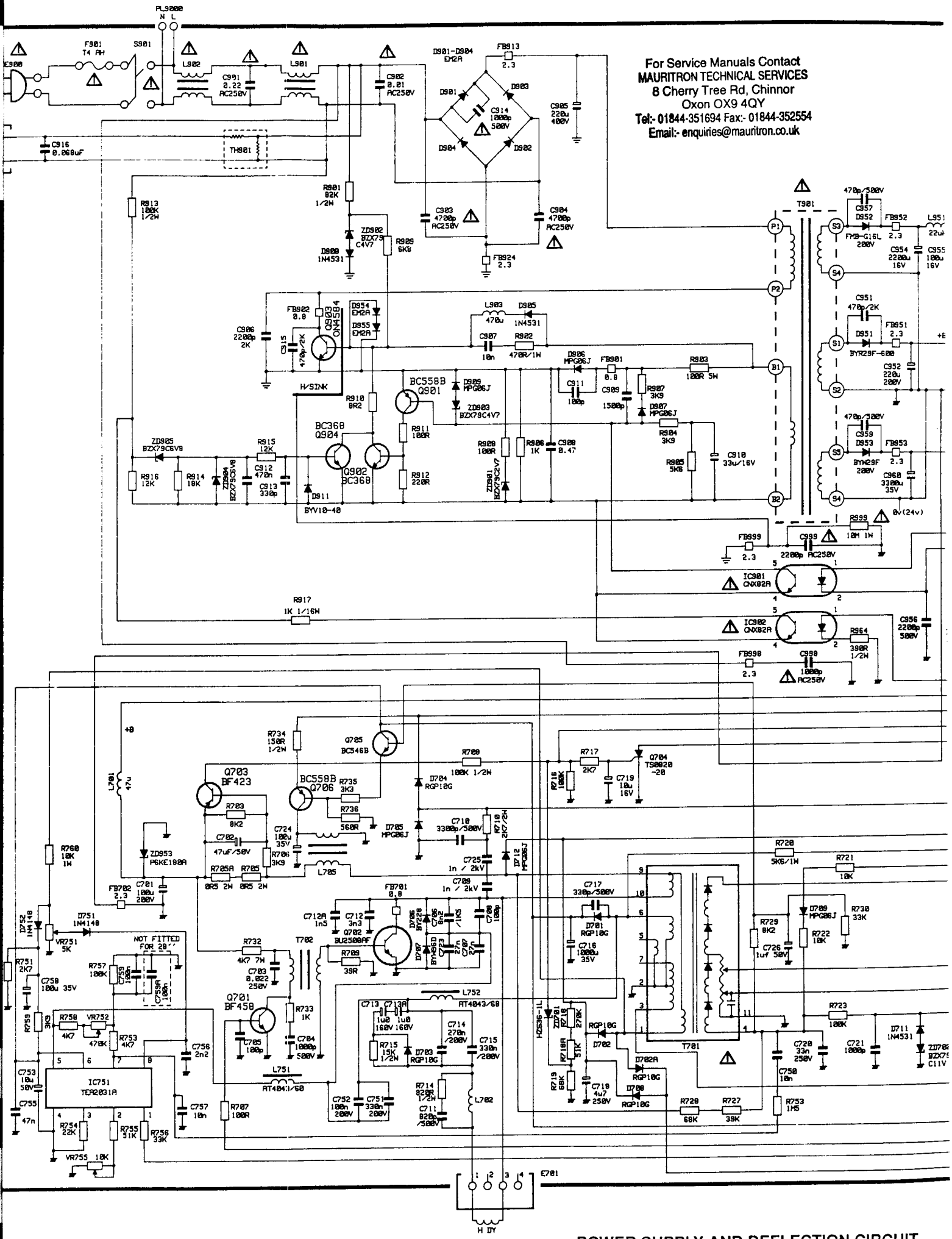
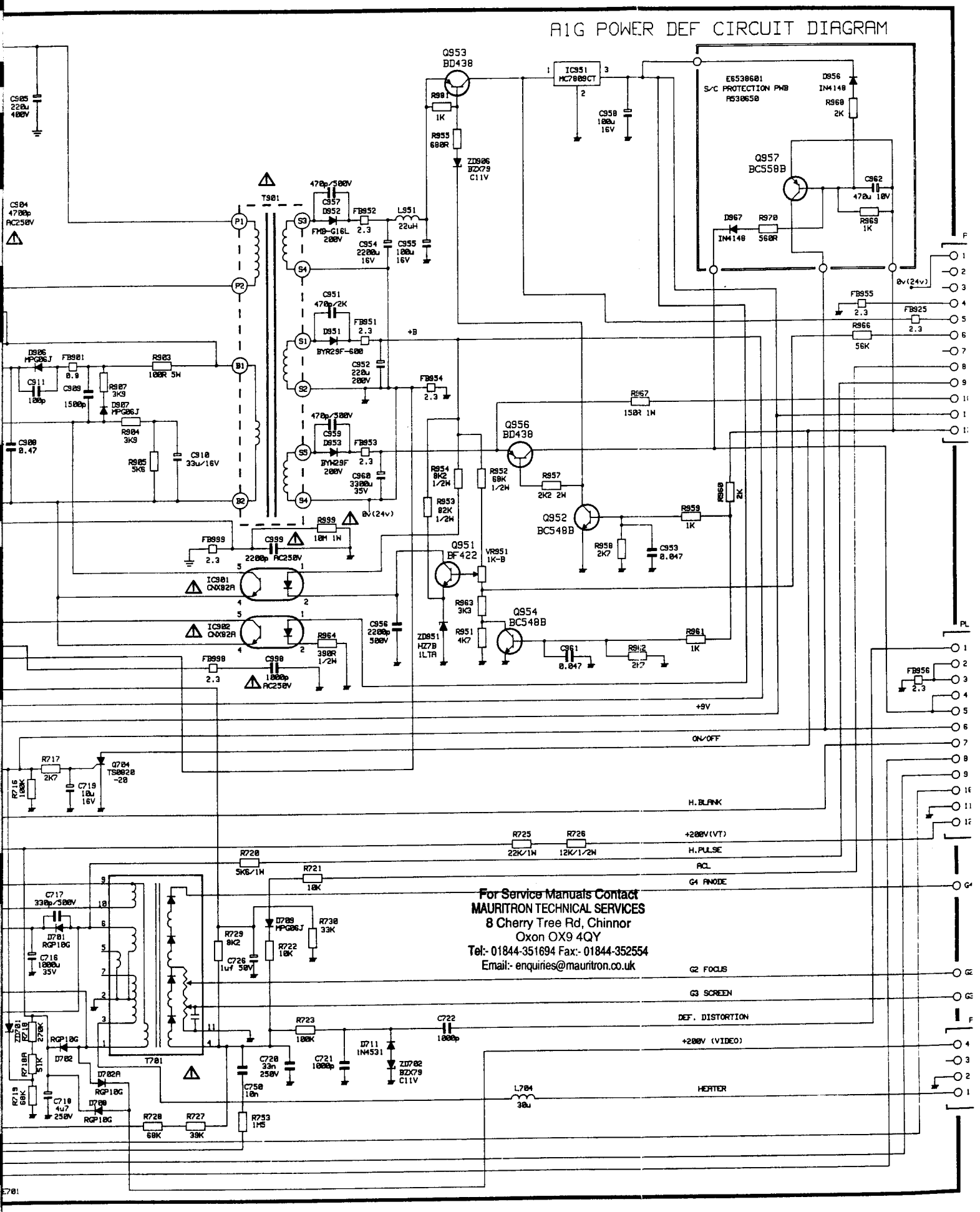
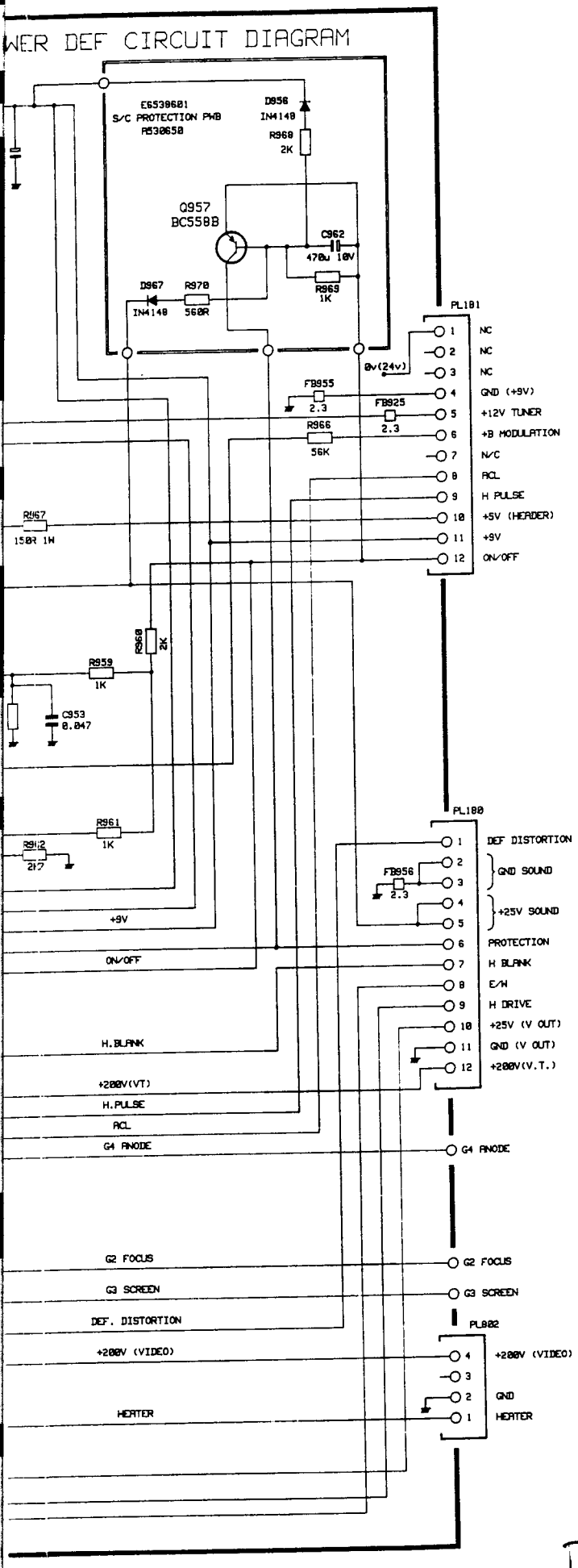


POWER SUPPLY AND DEFLECTION CIRCUIT



POWER SUPPLY AND DEFLECTION CIRCUIT

WER DEF CIRCUIT DIAGRAM



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DOLBY BOARD TRANSISTORS

	Q4601	Q4602	Q4604	Q4605	Q4606
C	10v DOLBY+OFF 0v other	0v	10v HALL+OFF 0v other	0v HALL+OFF 9v0 other	11v9 DOLBY 0v other
B	0v DOLBY+OFF 6v8 other	10v DOLBY+OFF 0v other	0v2 HALL+OFF 6v7 other	10v HALL+OFF 0v other	0v HALL+DOLBY 4v6 other
E	0v	0v	0v	0v	0v

POWER/DEFLECTION BOARD ICs

IC901 CNX82A			
Pin	Volts	Pin	Volts
1	130v5 (56v)	4	–4v6 (–0v1)
2	129v5 (55v)	5	0v4 (0v1
3	not used	6	not used

() = standby

IC902 CNX82A			
Pin	Volts	Pin	Volts
1	9v0 (0v1)	4	–4v5 (–0v2)
2	7v8 (0v)	5	–4v5 (5v7)
3	not used	6	not used

() = standby

IC751 TEA2031A			
Pin	Volts	Pin	Volts
1	6v5	5	10v1
2	6v5	6	26v8
3	6v4	7	10v
4	0v	8	10v

IC951 MC7809CT	
Pin	Volts
1	11v6
2	0v
3	9v0

POWER/DEFLECTION BOARD TRANSISTORS

	Q701	Q702	Q703	Q704	Q705	Q706
C	0v	206v	0v	A 3v8	26v9	1v1
B	0v	0v	146v7	G 0v	11v2	1v6
E	0v	0v	147v	K 0v	10v6	2v4

	Q901	Q902	Q903	Q904	Q951	Q952
C	–2v2	–4v5	328v	–4v5	130v (55v)	0v1 (13v9)
B	0v4	–2v6	0v	–2v6	7v5	0v7 (0v)
E	0v	–4v4	0v	–4v4	6v9	0v

() = standby

	Q953	Q954	Q956	Q957
C	11v7	0v (4v1)	30v9 (0v6)	0v
B	11v1	0v7 (0v)	30v3 (13v9)	3v8
E	11v8	0v	31v (14v4)	3v8

() = standby

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SUB-POWER SUPPLY ICs

IC9000 UC384			
Pin	Volts	Pin	Volts
1	1v9	5	0v
2	2v2	6	0v5
3	0v	7	15v1
4	0v	8	5v0

OP9000 CNX82A			
Pin	Volts	Pin	Volts
1	10v4	4	0v
2	9v3	5	1v9
3	not used	6	not used

IC9100 TL431CLP	
Pin	Volts
A	0v
G	2v5
K	9v3

SUB-POWER SUPPLY TRANSISTORS

	Q9000	Q9001	Q9002	Q9100	Q9101
C	323v (345v)	0v	S 14v5	9v3	0v
B	14v5 (12v)	3v2	G 0v	0v	0v8
E	14v5 (12v)	3v7	D 5v5	0v	0v

() = standby

CRT BASE TRANSISTORS

	Q801	Q802	Q803	Q811	Q812	Q813
C	111v -160v	97v5 -151v	105v9 -153v5	8v3	8v3	8v3
B	8v8	8v8	8v8	2v8 - 1v1	2v9 - 1v1	2v9 - 1v1
E	8v3	8v3	8v3	2v4 - 9v9	2v4 - 0v8	2v4 - 0v8

	Q851	Q852
C	0v	0v9
B	0v9	0v
E	1v6	0v

AUDIO SUB-AMPLIFIER BOARD ICs

IC4901 TDA2009A			
Pin	Volts	Pin	Volts
1	1v3	7	0v
2	0v7	8	12v5
3	14v2	9	25v9
4	0v7	10	12v5
5	1v3	11	12v5
6	0v		

IC4902 TDA2009A			
Pin	Volts	Pin	Volts
1	1v4	7	0v
2	0v7	8	13v
3	14v2	9	25v9
4	0v7	10	12v9
5	1v4	11	13v
6	0v		

IC4903 LM7805	
Pin	volts
1	27v
2	0v
3	5v0

SUB-AMPLIFIER BOARD TRANSISTORS

	Q4901	Q4902	Q4904	Q4991	Q4992	Q4993
C	0v7	4v8	0v	0v	0v	0v
B	27v	0v	0v7	0v1	0v1	0v1
E	27v	0v	0v	0v	0v	0v

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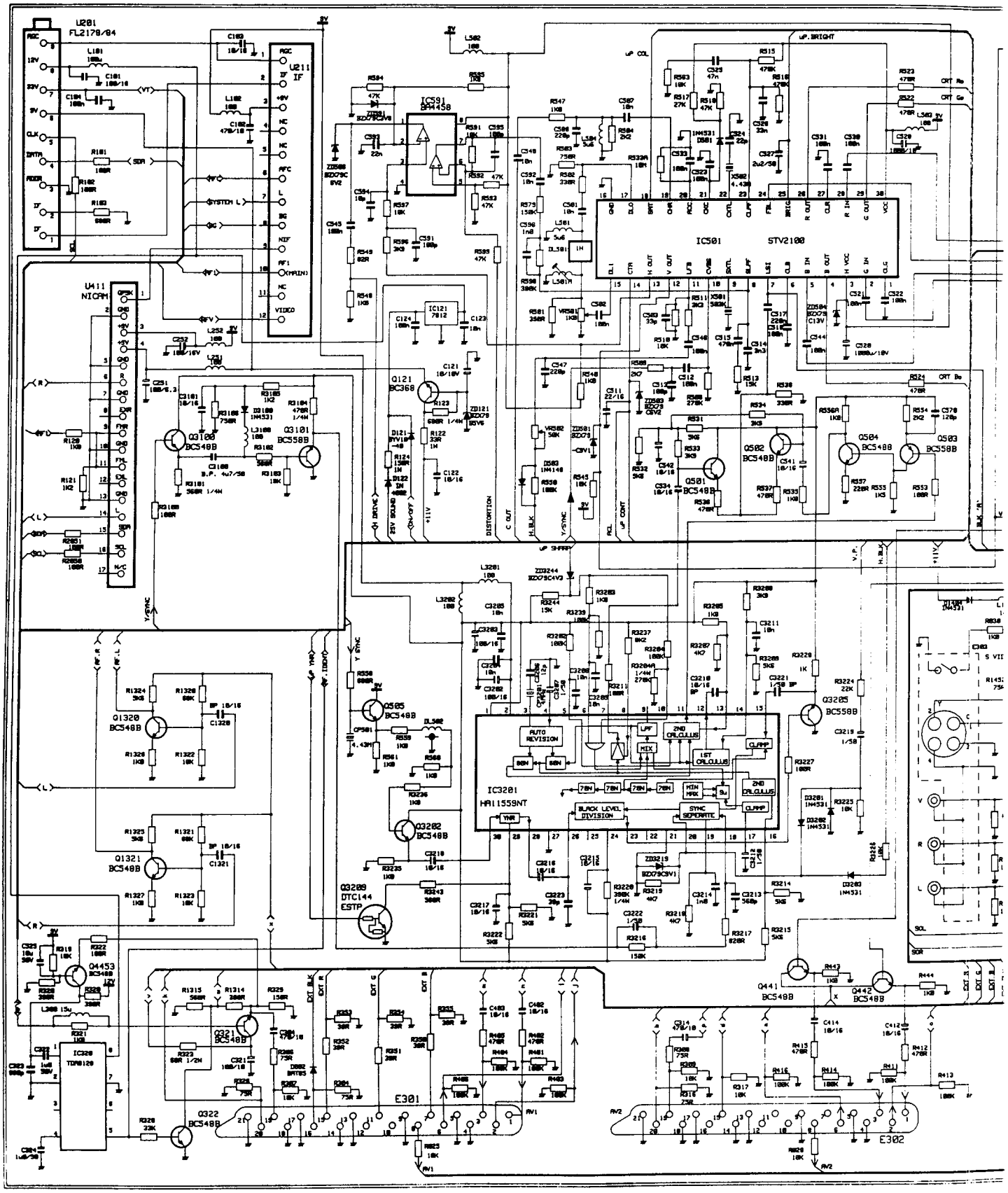

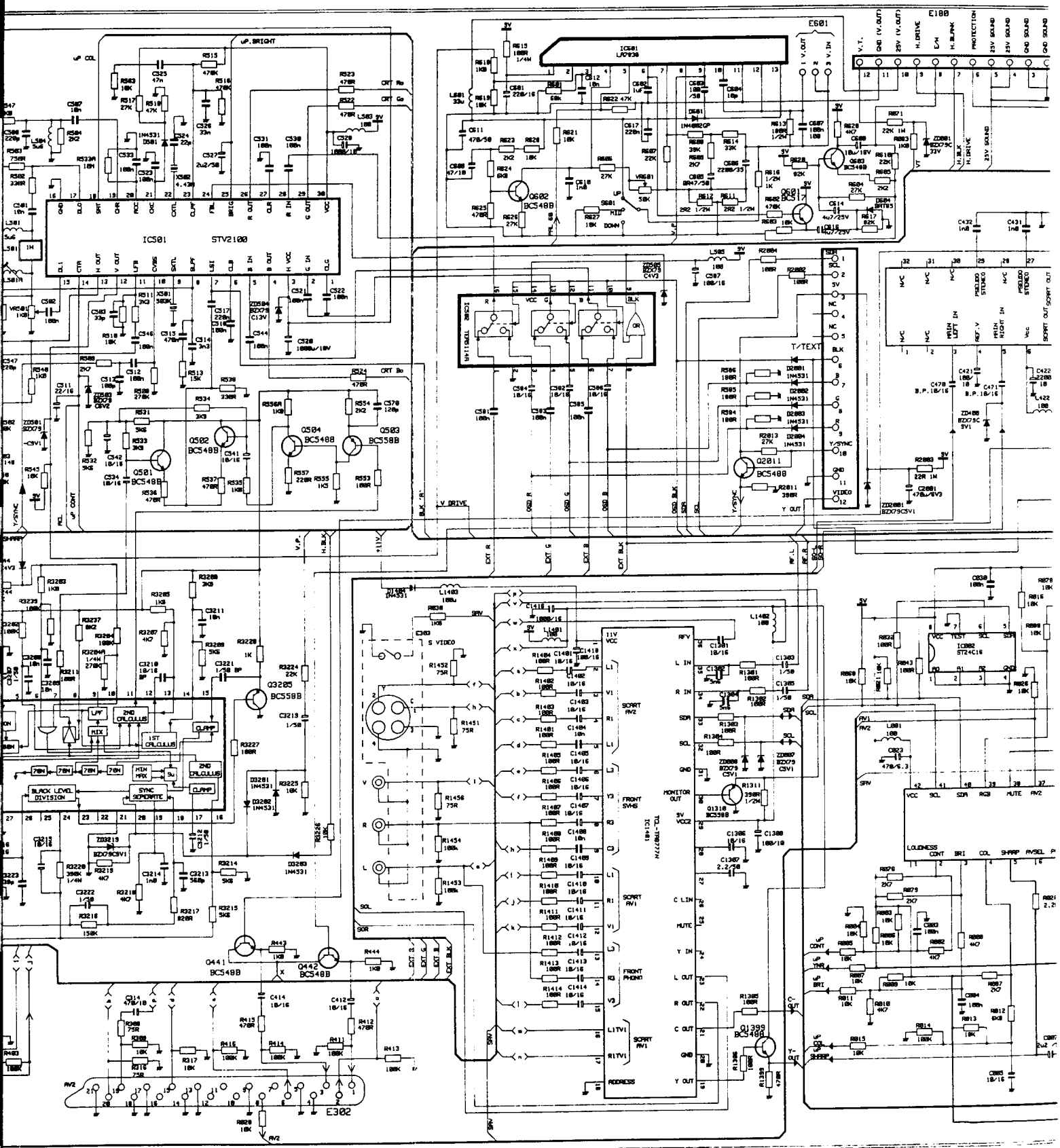

SIGNAL AND CONTROL CIRCUIT

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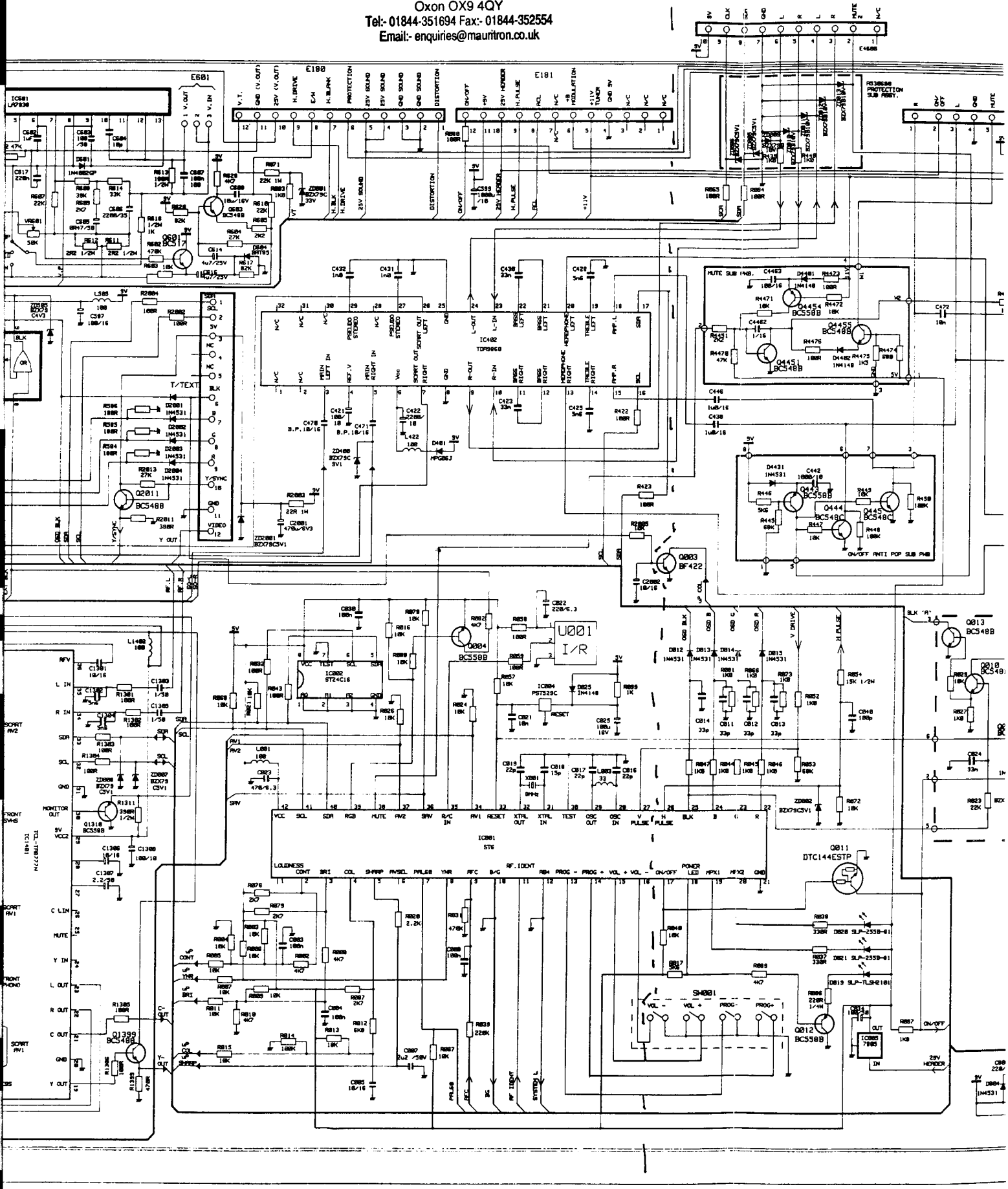
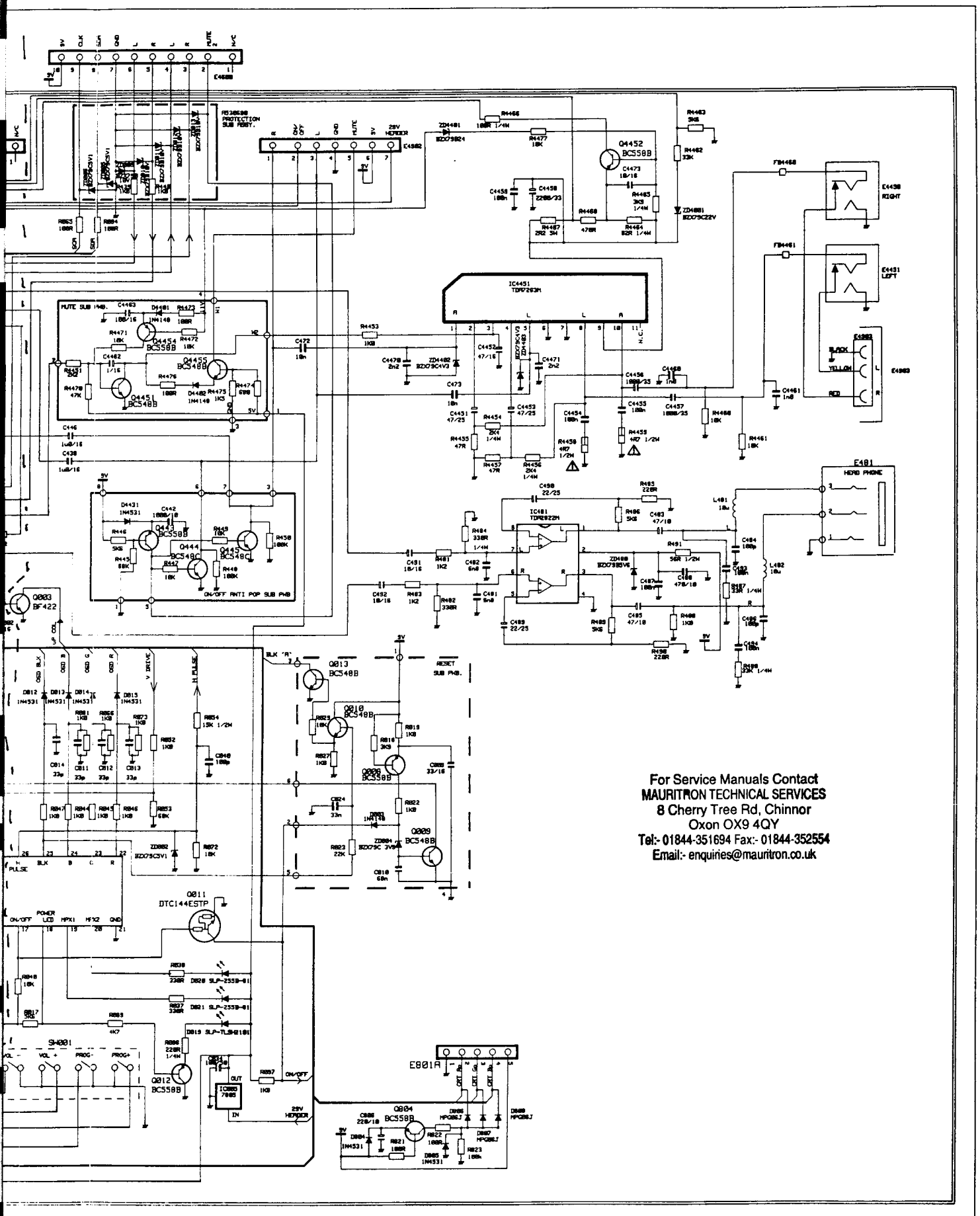


SIGNAL AND CONTROL CIRCUIT



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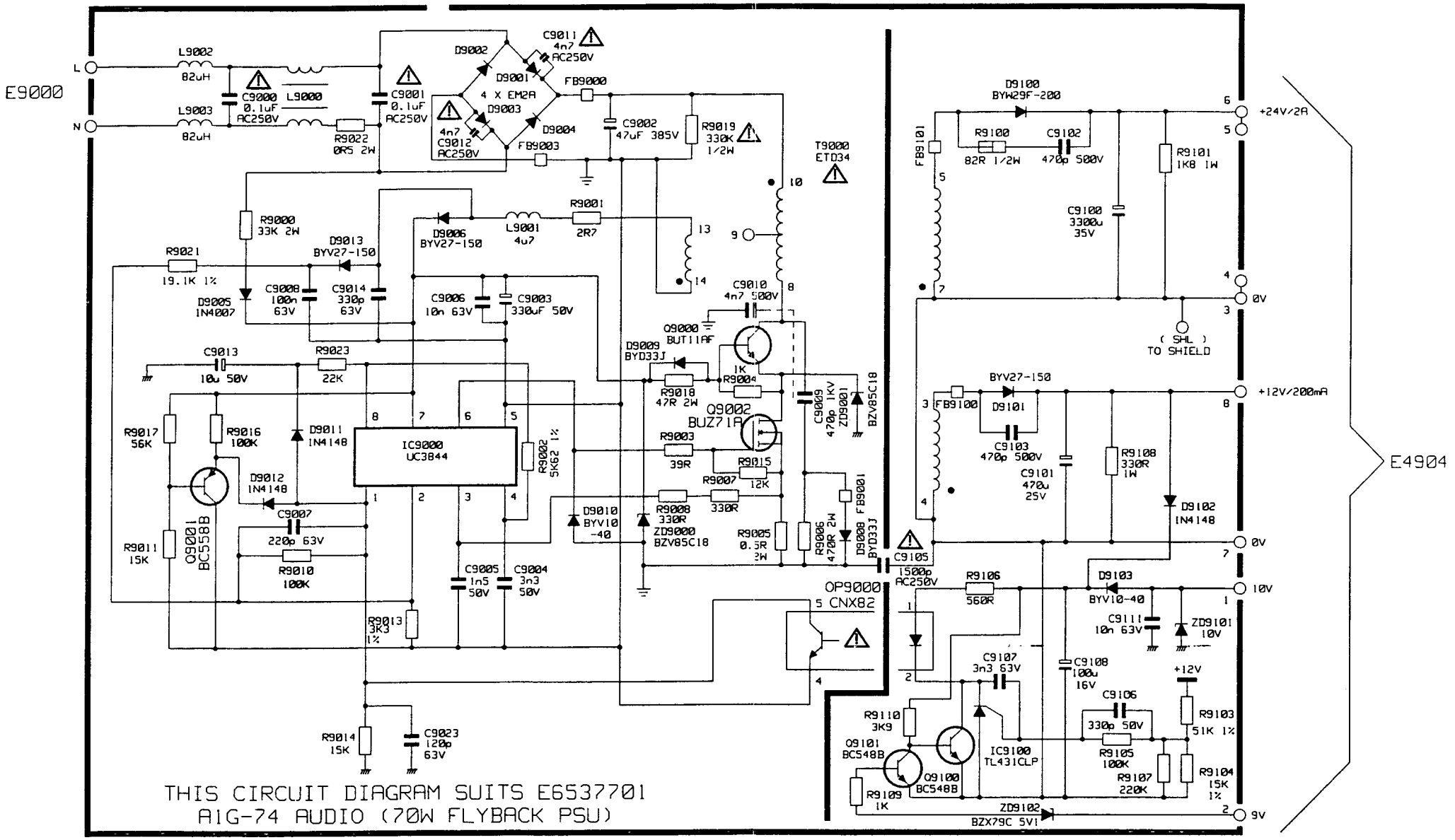
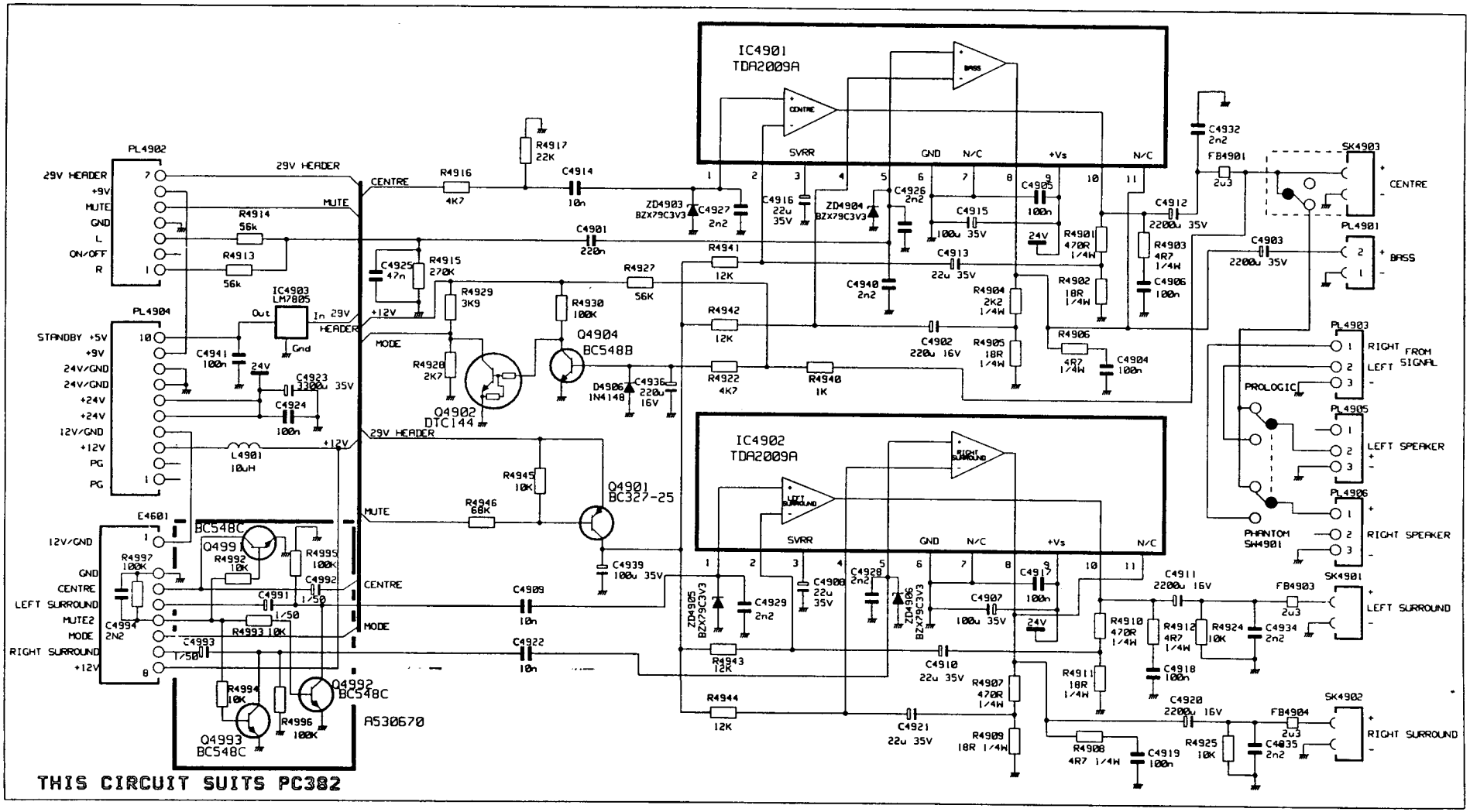


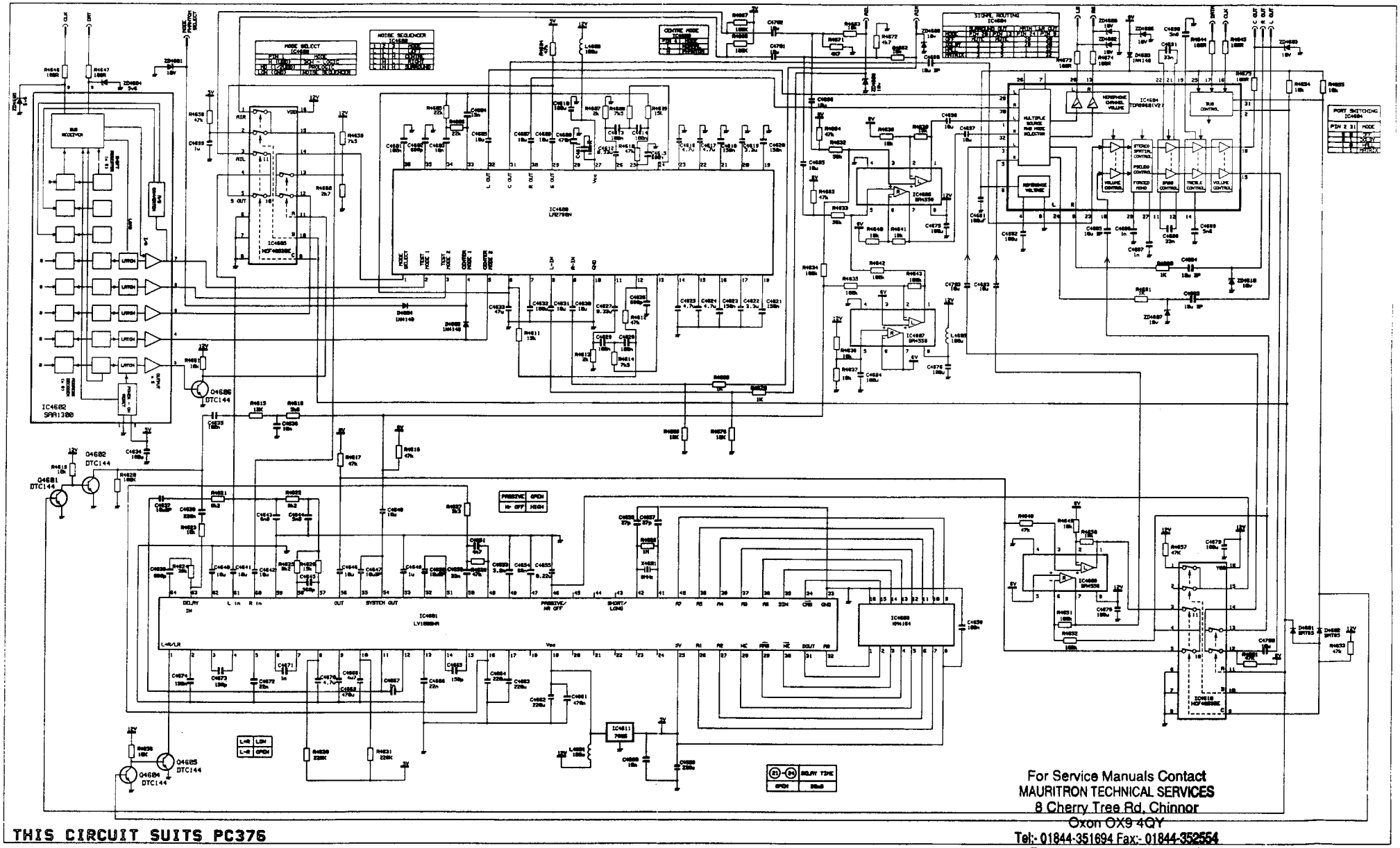
POWER SUPPLY SUB-PANEL CIRCUIT



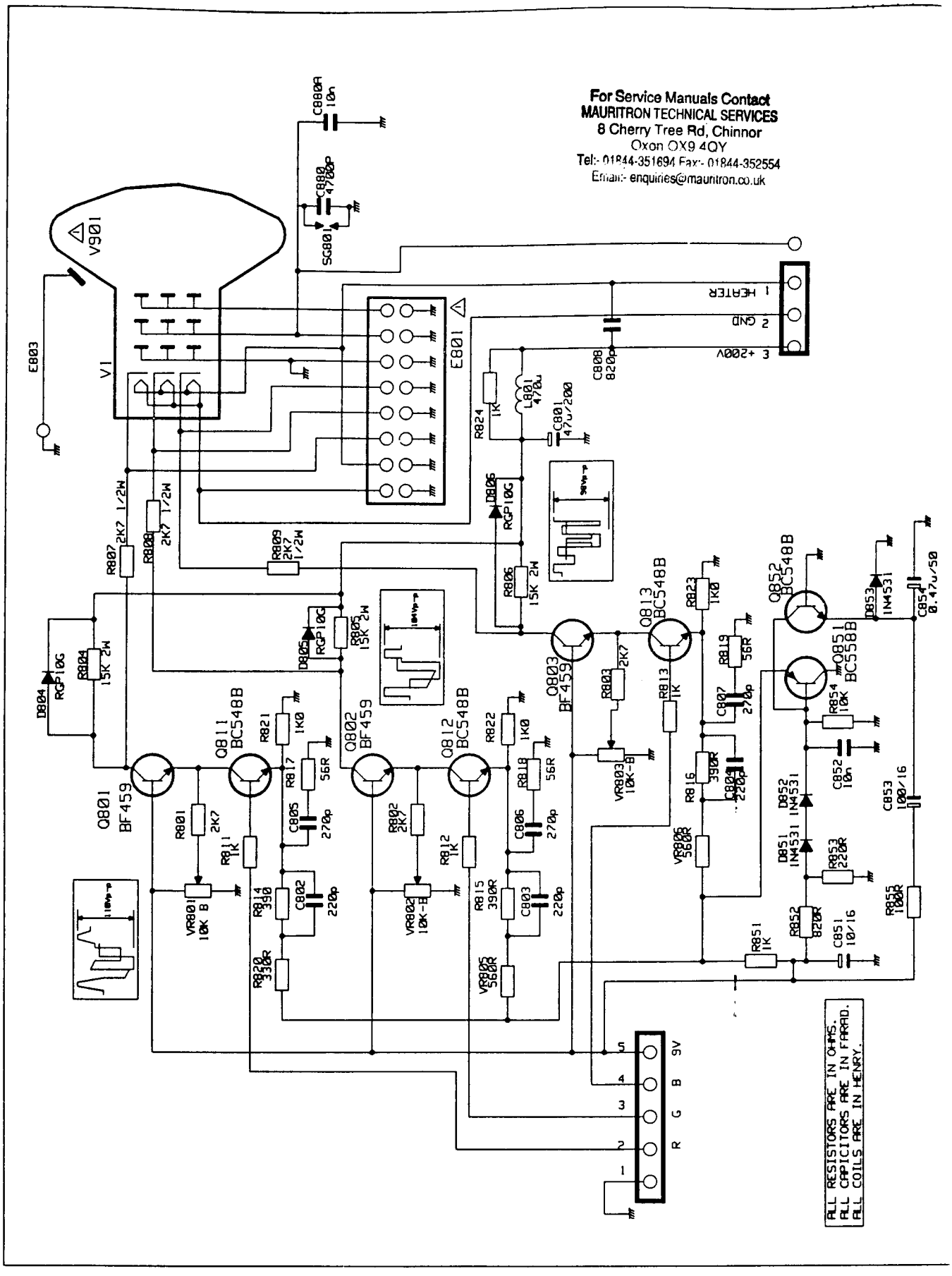
AUDIO SUB-AMP CIRCUIT

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk

C.R.T. BASE CIRCUIT



DOLBY CIRCUIT


For Service Manuals Contact
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Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@maunitron.co.uk
V901
V1
E803
E801
SG801
C880A 10n
C880 4700p
HEATER
GND
+200V
C808 820p
L801 470u
C801 47u/200
R824 1K
D806 RGP10G
R806 15K 2W
R807 2K7 1/2W
R808 2K7 1/2W
R809 2K7 1/2W
D804 RGP10G
R804 15K 2W
D805 RGP10G
R805 15K 2W
Q801 BF459
Q811 BC548B
Q802 BF459
Q812 BC548B
Q803 BF459
Q813 BC548B
Q852 BC548B
Q851 BC558B
R801 2K7
R811 1K
R821 1K0
R817 56R
R802 2K7
R812 1K
R822 1K0
R818 56R
R803 2K7
R813 1K
R823 1K0
R819 56R
VR801 10K B
VR802 10K B
VR803 10K-B
R814 390R
R815 390R
R816 390R
C802 220p
C803 220p
C804 220p
C805 270p
C806 270p
C807 270p
R820 330R
VR804 560R
VR805 560R
R851 1K
R852 820R
R853 220R
R854 10K
R855 100R
D851 IN4531
D852 IN4531
D853 IN4531
C851 10/16
C852 10n
C853 100/16
C854 0.47u/50
5
4
3
2
1
R G B 9V
ALL RESISTORS ARE IN OHMS.
ALL CAPACITORS ARE IN FARAD.
ALL COILS ARE IN HENRY.

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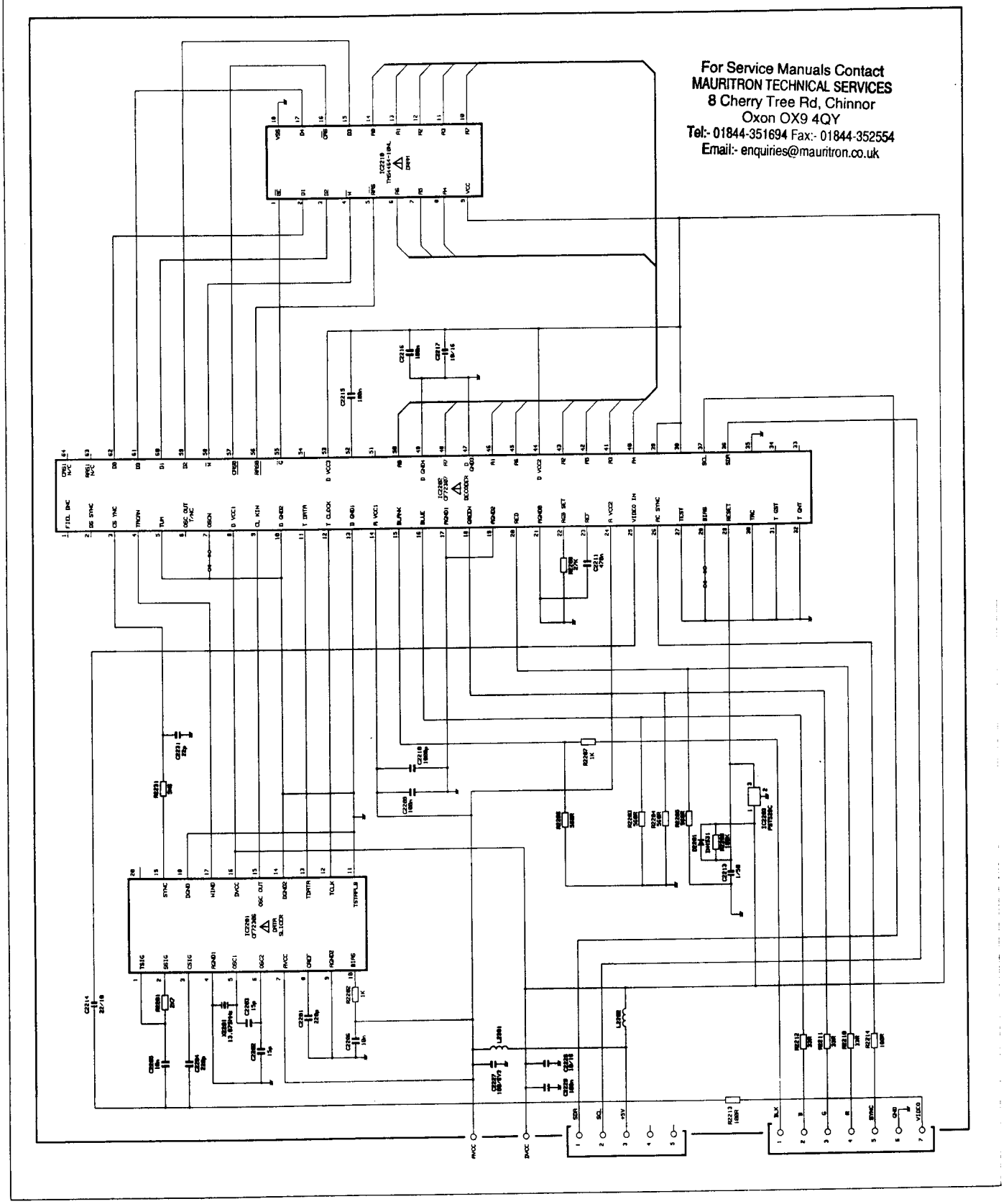
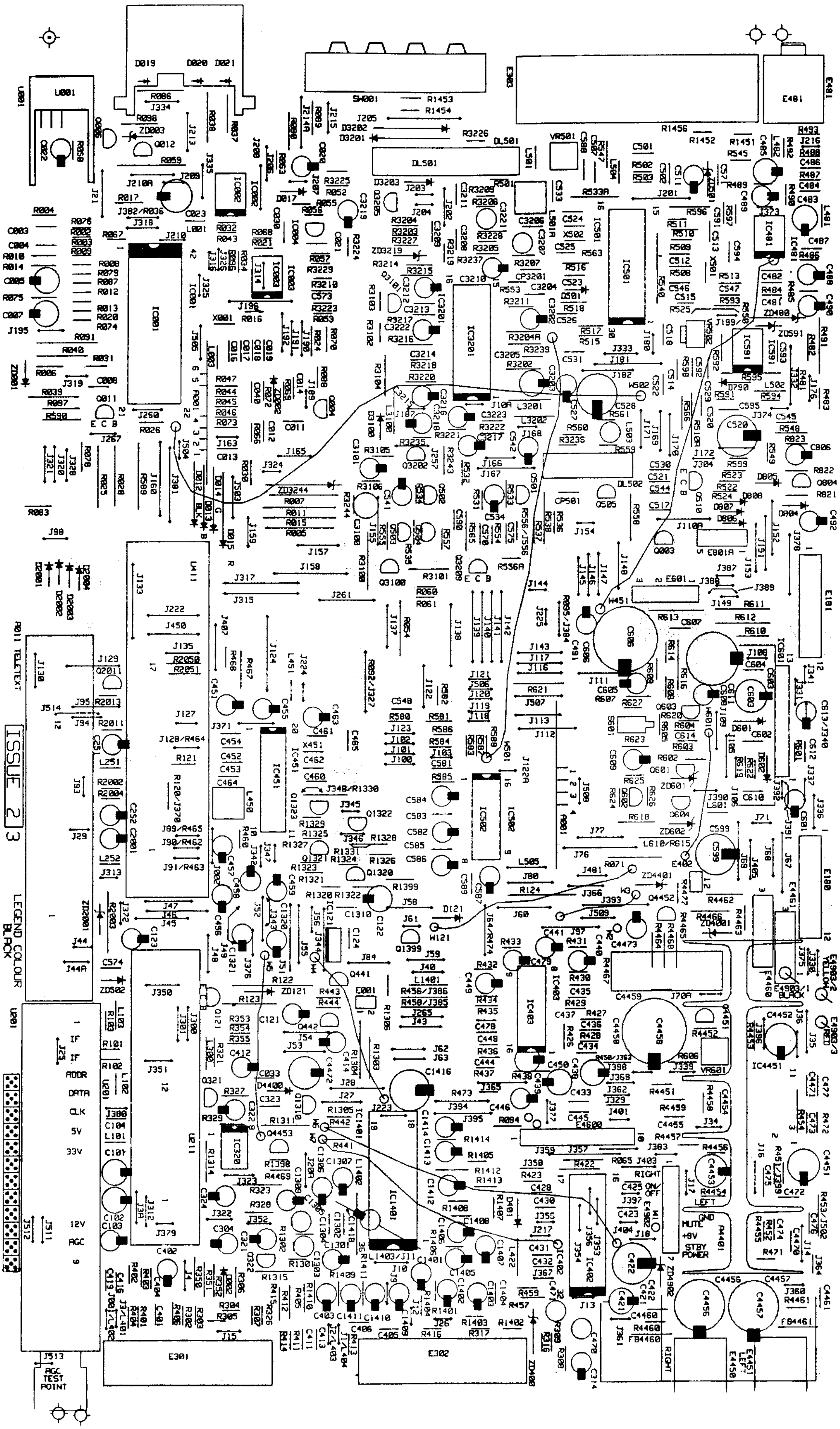
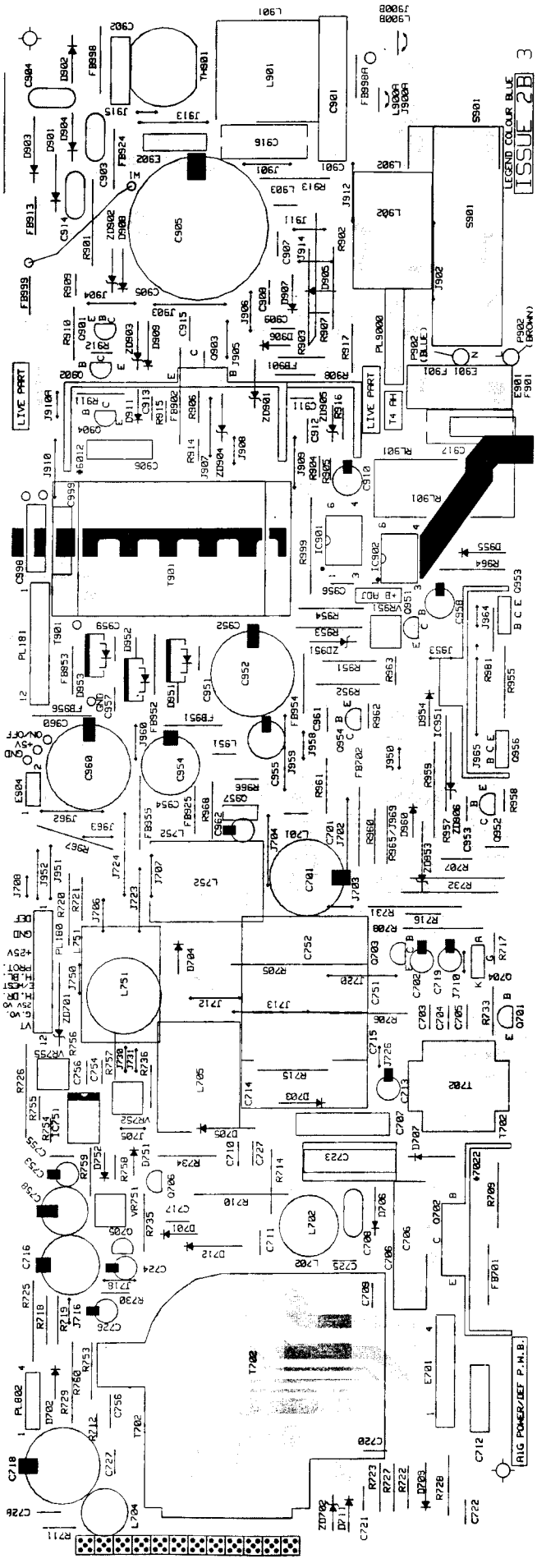


TELETEXT CIRCUIT



SIGNAL AND CONTROL P.C.B. PRINT SIDE



POWER SUPPLY AND DEFLECTION P.C.B. PRINT SIDE

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
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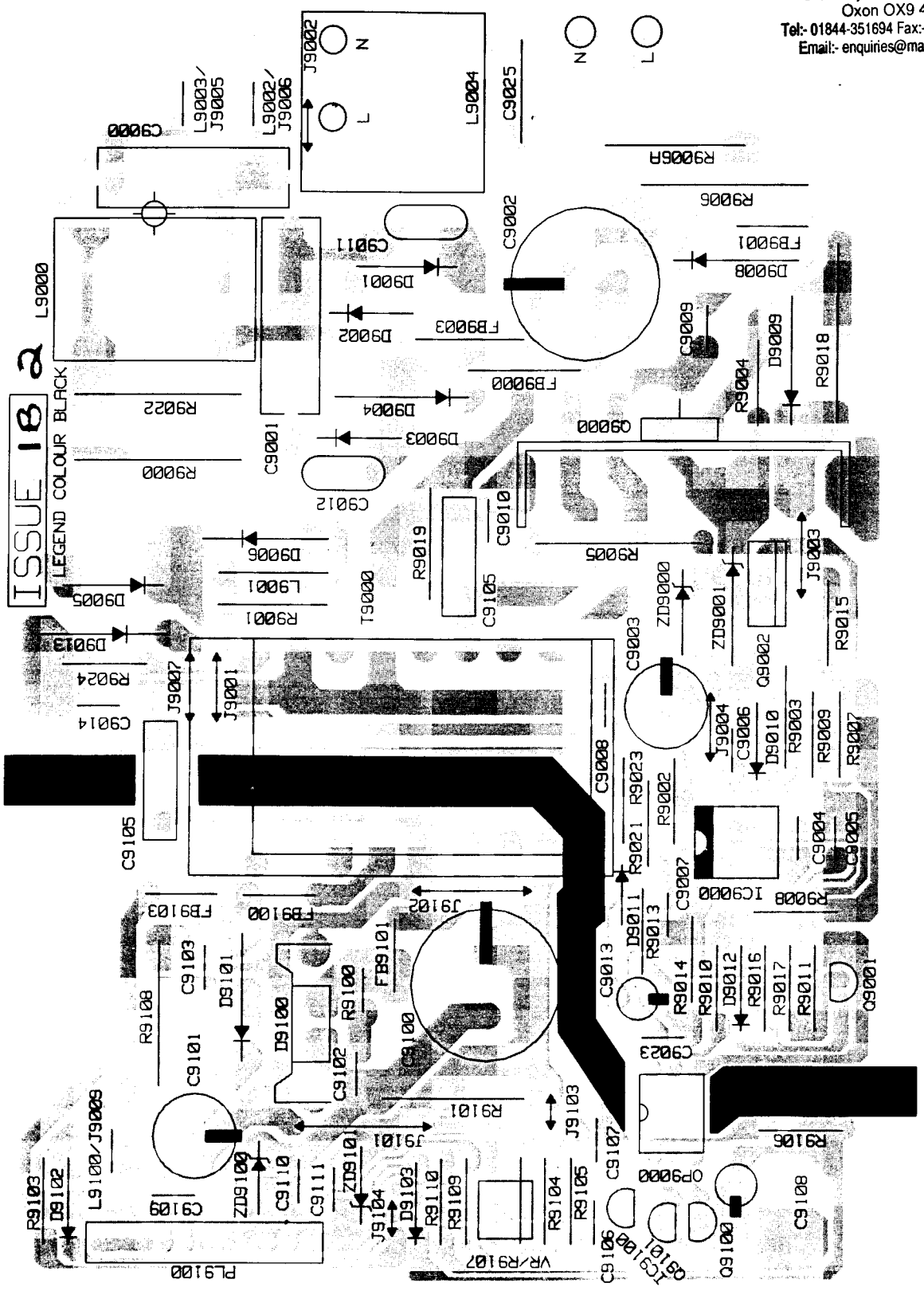

POWER SUPPLY SUB-PANEL P.C.B. PRINT SIDE

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Oxon OX9 4QY
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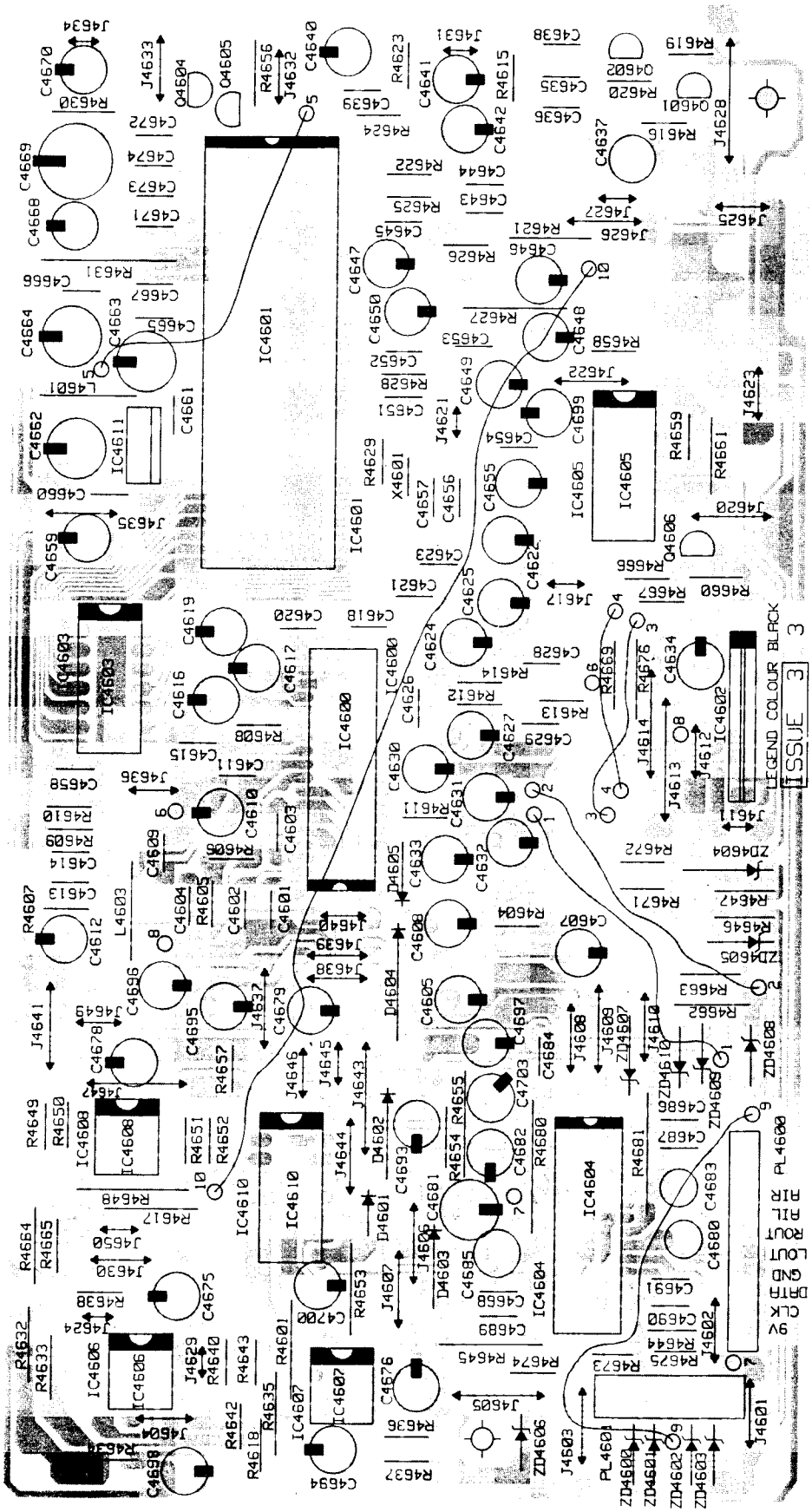
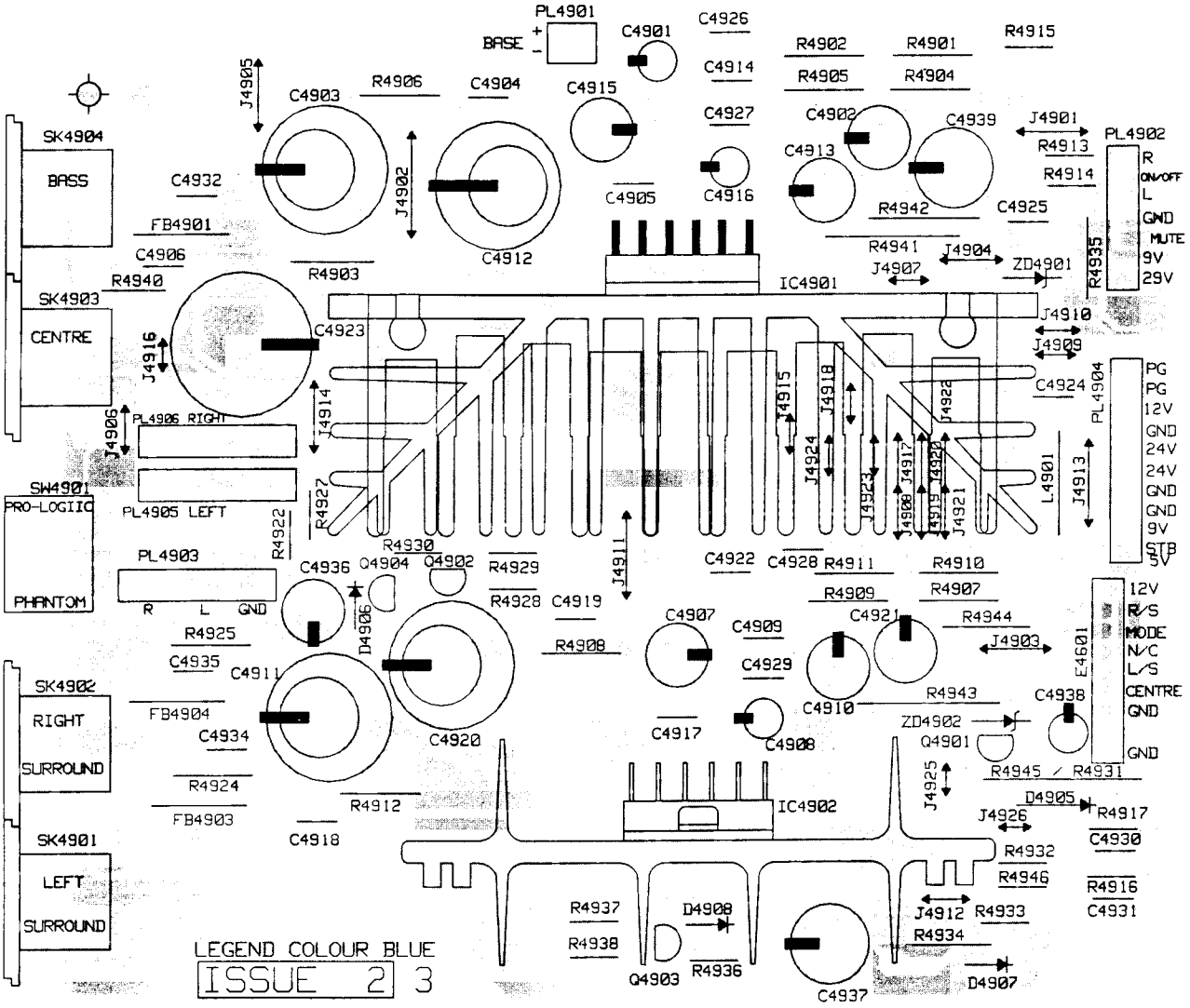
Email:- enquiries@mauritron.co.uk



DOLBY P.C.B. PRINT SIDE



AUDIO SUB-AMP P.C.B. PRINT SIDE

For Service Manuals Contact
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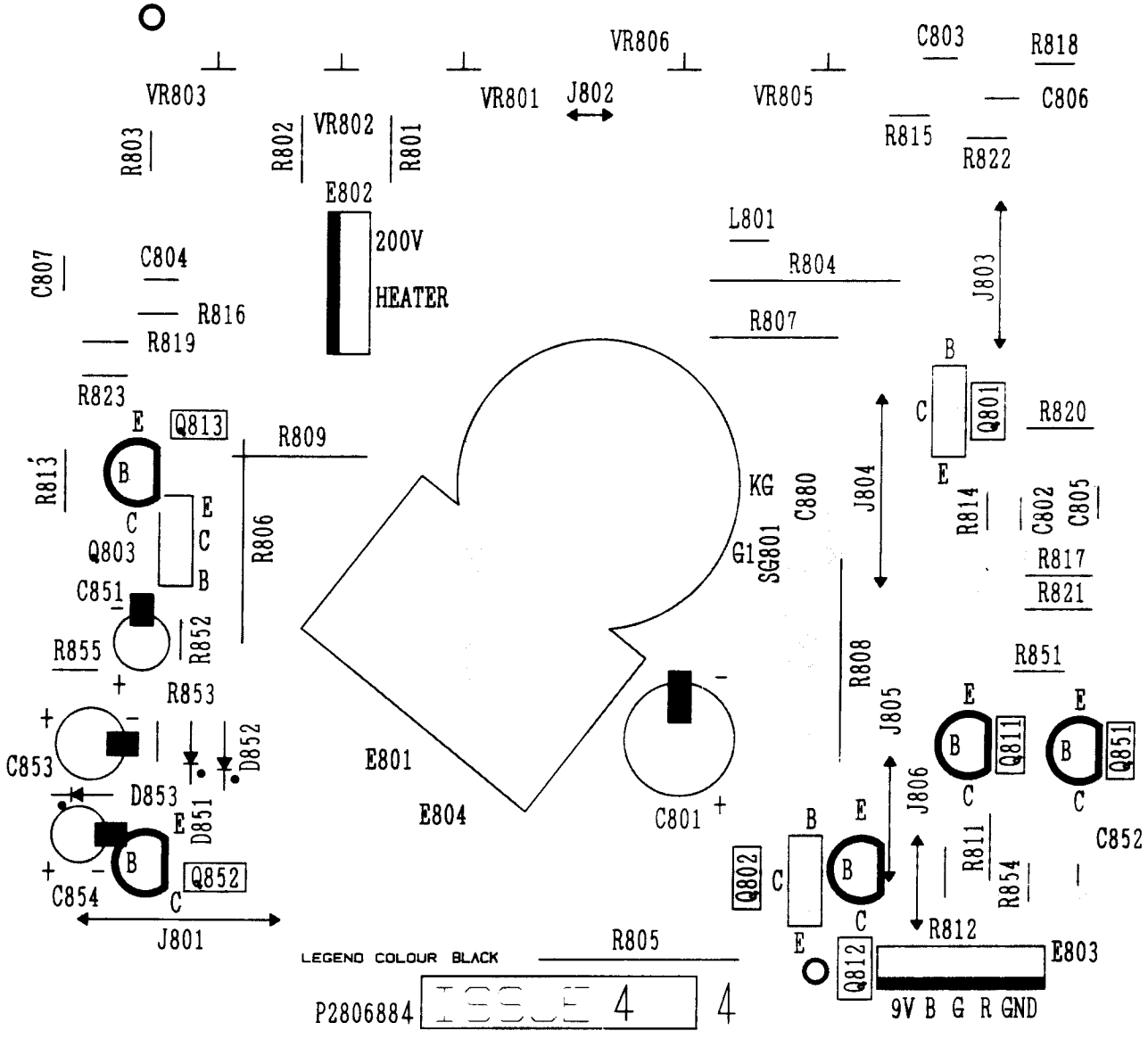
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk



C.R.T. BASE P.C.B. PRINT SIDE

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PRESENTATION PARTS

⚠ C.R.T. TYPE A59EDN43X01	T159012
⚠ C.R.T. TYPE A66EDN43X01	T166016
⚠ CABINET BACK C2574TN	X240336
⚠ CABINET BACK C2874TN	X263343
CABINET FRONT C2574TN	X212412
CABINET FRONT C2874TN	X212402
CONTROL DOOR	X263142
HITACHI BADGE	X640242
INFRA RED LENS (Cabinet)	X425051
⚠ MAINS LEAD WITH MOULDED PLUG	E846629
MAINS ON/OFF KNOB	X321031
OPERATING GUIDE	X830851
QUICK GUIDE	X830849
REMOTE CONTROL HANDSET	X100023
SPEAKER BOXES (REAR)	X263271
SPEAKER BOXES (FRONT)	X263272
TV STAND ASSEMBLY C2574TN	X711333
TV STAND ASSEMBLY C2874TN	X711334

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MISCELLANEOUS PARTS

⚠ C.R.T. BASE SOCKET	2698351
⚠ DEGAUSSING COIL C2574TN	2274361
⚠ DEGAUSSING COIL C2874TN	2274362
EXTENSION SPEAKER SOCKETS (E4450/1, SK4901/2/3)	2983041
⚠ FUSE TYPE 4A (F901)	E882376
FUSE HOLDER FOR F901	2721792
HEADPHONE SOCKET	2679382
⚠ MAINS ON/OFF SWITCH	2633391
PHANTOM/PRO LOGIC SWITCH (SW4901)	E142206
SCART SOCKETS	2986121
SPEAKERS (WOOFER 4Ω)	E511117
(8Ω 12W)	E511121
S-VHS SOCKET/PHONO SOCKET ASSEMBLY	2673821
SCART PLUG AND LEAD	E847141
TOUCH BUTTON BLOCK (SW001)	E139408

PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this service manual. Don't degrade the safety of this reciever through improper servicing.

Resistor Abbreviation	Type
CF	Carbon Film
MO	Metal Oxide
FF	Fusible Film
VR	Variable Control
MF	Metal Film
WW	Wire Wound

Capacitor Abbreviation	Type
C	Ceramic
PF	Plastic Film
FT	Feed Through
MPO	Met.Polyester
MPS	Mica/Polystyrene
MP	Metallised paper
TA	Tantalum

Ref No.	Part No.	Value	Type	%Tol	Wattage
R002	0700049M	4K7	CF	5	1/16
R003-07	0700054M	10K	CF	5	1/16
R008	0700049M	4K7	CF	5	1/16
R009	0700054M	10K	CF	5	1/16
R010	0700049M	4K7	CF	5	1/16
R011	0700054M	10K	CF	5	1/16
R012	0700052M	6K8	CF	5	1/16
R013	0700057M	18K	CF	5	1/16
R014	0700067M	100K	CF	5	1/16
R015	0700054M	10K	CF	5	1/16
R016	0700054M	10K	CF	5	1/16
R017	0700051M	5K6	CF	5	1/16
R018	0700048M	3K9	CF	5	1/16
R019	0700041M	1K0	CF	5	1/16
R020	0700045M	2K2	CF	5	1/16
R021	0700054M	10K	CF	5	1/16
R022	0700041M	1K0	CF	5	1/16
R023	0700058M	22K	CF	5	1/16
R024	0700054M	10K	CF	5	1/16
R025	0700054M	10K	CF	5	1/16
R026	0700054M	10K	CF	5	1/16
R027	0700041M	1K0	CF	5	1/16
R028	0700054M	10K	CF	5	1/16
R029	0700054M	10K	CF	5	1/16
R030	0700041M	1K0	CF	5	1/16
R031	0700076M	470K	CF	5	1/16
R032	0700027M	100R	CF	5	1/16
R037	0700034M	330R	CF	5	1/16
R038	0700034M	330R	CF	5	1/16
R039	0700072M	220K	CF	5	1/16
R040	0700054M	10K	CF	5	1/16
R042	0700054M	10K	CF	5	1/16
R043	0700027M	100R	CF	5	1/16
R044-47	0700041M	1K0	CF	5	1/16
R052	0700041M	1K0	CF	5	1/16
R053	0700065M	68K	CF	5	1/16
R054	R145319	15K	CF	5	1/2
R057	0700054M	10K	CF	5	1/16
R058	0700027M	100R	CF	5	1/16
R059	0700027M	100R	CF	5	1/16
R065	0700027M	100R	CF	5	1/16
R066	0700036M	470R	CF	5	1/16
R067	0700054M	10K	CF	5	1/16
R068	0700054M	10K	CF	5	1/16
R071	0110177S	22K	MO	5	1
R072	0700054M	10K	CF	5	1/16
R073	0700036M	470R	CF	5	1/16
R076	0700046M	2K7	CF	5	1/16
R078	0700054M	10K	CF	5	1/16
R079	0700046M	2K7	CF	5	1/16
R080	0700027M	100R	CF	5	1/16
R081	0700036M	470R	CF	5	1/16
R083	0700041M	1K0	CF	5	1/16
R086	0700032M	220R	CF	5	1/16
R087	0700046M	2K7	CF	5	1/16
R088	0700054M	10K	CF	5	1/16
R089	0700049M	4K7	CF	5	1/16
R092	0700049M	4K7	CF	5	1/16
R094	0700027M	100R	CF	5	1/16
R097	R130330	1K0	CF	5	1/4
R099	0700041M	1K0	CF	5	1/16
R101	0700027M	100R	CF	5	1/16
R102	0700027M	100R	CF	5	1/16
R103	0700038M	680R	CF	5	1/16

Ref No.	Part No.	Value	Type	%Tol	Wattage
R120	0700041M	1K0	CF	5	1/16
R121	0700042M	1K2	CF	5	1/16
R122	0110209M	33R	MO	5	2
R123	R628330	680R	CF	5	1/4
R124	R125542	150R	MO	5	1
R304	0187038M	75R	CF	5	1/16
R306	0187038M	75R	CF	5	1/16
R307	0700054M	10K	CF	5	1/16
R308	0187038M	75R	CF	5	1/16
R309	0700054M	10K	CF	5	1/16
R316	0187038M	75R	CF	5	1/16
R317	0700054M	10K	CF	5	1/16
R318	0700054M	10K	CF	5	1/16
R319	0700055M	12K	CF	5	1/16
R320	0700035M	390R	CF	5	1/16
R321	0700041M	1K0	CF	5	1/16
R322	R120330	100R	CF	5	1/4
R323	R618319	68R	CF	5	1/2
R326	0187038M	75R	CF	5	1/16
R328	0700061M	33K	CF	5	1/16
R329	R125330	150R	CF	5	1/4
R350-55	0187031M	39R	CF	5	1/16
R401	0700067M	100K	CF	5	1/16
R402	0700036M	470R	CF	5	1/16
R403	0700067M	100K	CF	5	1/16
R404	0700067M	100K	CF	5	1/16
R405	0700036M	470R	CF	5	1/16
R406	0700067M	100K	CF	5	1/16
R411	0700067M	100K	CF	5	1/16
R412	0700036M	470R	CF	5	1/16
R413	0700067M	100K	CF	5	1/16
R414	0700067M	100K	CF	5	1/16
R415	0700036M	470R	CF	5	1/16
R416	0700067M	100K	CF	5	1/16
R422	0700027M	100R	CF	5	1/16
R423	0700027M	100R	CF	5	1/16
R439	0700041M	1K0	CF	5	1/16
R440	0700041M	1K0	CF	5	1/16
R443	0700041M	1K0	CF	5	1/16
R444	0700041M	1K0	CF	5	1/16
R446	0700051M	5K6	CF	5	1/16
R447	0700054M	10K	CF	5	1/16
R448	0700067M	100K	CF	5	1/16
R449	0700054M	10K	CF	5	1/16
R450	0700067M	100K	CF	5	1/16
R481	0700042M	1K2	CF	5	1/16
R482	0700034M	330R	CF	5	1/16
R483	0700042M	1K2	CF	5	1/16
R484	0700034M	330R	CF	5	1/16
R485	0700032M	220R	CF	5	1/16
R486	0700051M	5K6	CF	5	1/16
R487	R313330	33R	CF	5	1/4
R488	R313330	33R	CF	5	1/4
R489	0700051M	5K6	CF	5	1/16
R490	0700032M	220R	CF	5	1/16
R491	R516319	56R	CF	5	1/2
VR501	0160211R	1K0	VR	HANOVER BLIND ADJ.	
R501	0700035M	390R	CF	5	1/16
VR502	0160228R	50K	VR	HORIZ. PHASE	
R502	0700034M	330R	CF	5	1/16
R503	0187062M	750R	CF	5	1/16
R504	0700045M	2K2	CF	5	1/16
R508	0700073M	270K	CF	5	1/16
R509	0700046M	2K7	CF	5	1/16

PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this service manual. Don't degrade the safety of this receiver through improper servicing.

Ref No.	Part No.	Value	Type	%Tol	Wattage
R510	0700054M	10K	CF	5	1/16
R511	0700047M	3K3	CF	5	1/16
R513	0700056M	15K	CF	5	1/16
R515	0700076M	470K	CF	5	1/16
R516	0700076M	470K	CF	5	1/16
R517	0700059M	27K	CF	5	1/16
R518	0700063M	47K	CF	5	1/16
R522	0700036M	470R	CF	5	1/16
R523	0700036M	470R	CF	5	1/16
R524	0700036M	470R	CF	5	1/16
R531	0700051M	5K6	CF	5	1/16
R532	0700051M	5K6	CF	5	1/16
R533	0700048M	3K9	CF	5	1/16
⚠ R533A	R170714	10M	MF	5	1/2
R534	0700048M	3K9	CF	5	1/16
R535	0700041M	1K0	CF	5	1/16
R536	0700036M	470R	CF	5	1/16
R537	0700036M	470R	CF	5	1/16
R538	0700034M	330R	CF	5	1/16
R540	R130330	1K0	CF	5	1/4
R545	0700054M	10K	CF	5	1/16
R547	0700041M	1K0	CF	5	1/16
R548	0700041M	1K0	CF	5	1/16
R549	0700026M	82R	CF	5	1/16
R550	0700067M	100K	CF	5	1/16
R553	0700027M	100R	CF	5	1/16
R554	0700046M	2K7	CF	5	1/16
R555	0700043M	1K5	CF	5	1/16
R556A	0700041M	1K0	CF	5	1/16
R557	0700032M	220R	CF	5	1/16
R558	0700038M	680R	CF	5	1/16
R559	0700041M	1K0	CF	5	1/16
R560	0700041M	1K0	CF	5	1/16
R561	0700041M	1K0	CF	5	1/16
R563	0700054M	10K	CF	5	1/16
R579	0700069M	150K	CF	5	1/16
R584	0700031M	180R	CF	5	1/16
R585	0700031M	180R	CF	5	1/16
R586	0700031M	180R	CF	5	1/16
R591-94	0700063M	47K	CF	5	1/16
R595	0700044M	1K8	CF	5	1/16
R596	0700048M	3K9	CF	5	1/16
R597	0700054M	10K	CF	5	1/16
R598	0700075M	390K	CF	5	1/16
R599	0700063M	47K	CF	5	1/16
VR601	0160218R	50K	VR	VERT. CENTRE ADJ.	
R601	0700065M	68K	CF	5	1/16
R602	0700076M	470K	CF	5	1/16
R603	0700054M	10K	CF	5	1/16
R604	0700059M	27K	CF	5	1/16
R605	0700045M	2K2	CF	5	1/16
R606	0700059M	27K	CF	5	1/16
R607	0700059M	27K	CF	5	1/16
R608	0700062M	39K	CF	5	1/16
R609	0700046M	2K7	CF	5	1/16
R610	0700058M	22K	CF	5	1/16
R611	0113684M	2R2	MF	5	1/2
R612	0113684M	2R2	MF	5	1/2
R613	R128319	180R	CF	5	1/2
R614	0700061M	33K	CF	5	1/16
R615	R120330	100R	CF	5	1/4
R616	R130319	1K0	CF	5	1/2
R617	0700066M	82K	CF	5	1/16
R618	0700041M	1K0	CF	5	1/16
R619	0700054M	10K	CF	5	1/16
R620	0700066M	82K	CF	5	1/16
R621	0700054M	10K	CF	5	1/16
R622	0700063M	47K	CF	5	1/16
R623	0700045M	2K2	CF	5	1/16
R624	0700052M	6K8	CF	5	1/16
R625	0700036M	470R	CF	5	1/16
R626	0700059M	27K	CF	5	1/16
R628	0700054M	10K	CF	5	1/16
R703	R832330	8K2	CF	5	1/4
R705	R000505	0R5	MO	5	7
R705A	R000505	0R5	MO	5	7
R706	R339330	3K9	CF	5	1/4
R707	0700027M	100R	CF	5	1/16

Ref No.	Part No.	Value	Type	%Tol	Wattage
R708	R150319	100K	CF	5	1/2
R709	R319330	39R	CF	5	1/4
R710	0110255M	2K7	MO	5	2
R712	R110319	10R	CF	5	1/2
R714	R822319	820R	CF	5	1/2
R715	R145319	15k	CF	5	1/2
R716	0700067M	100K	CF	5	1/16
R717	0700046M	2K7	CF	5	1/16
R718	R257721	270K	MF	1	1/4
R718A	R541721	51K	MF	1	1/4
R719	0119651M	68K	MF	1	1/8
R720	0110163M	5K6	MO	5	1
R721	0700054M	10K	CF	5	1/16
R722	0700054M	10K	CF	5	1/16
R723	R150330	100K	CF	5	1/4
R725	0110177M	22K	MO	5	1
R726	R142319	12K	CF	5	1/2
R727	R349330	39K	CF	5	1/4
R728	R648330	68K	CF	5	1/4
R729	R832330	8K2	CF	5	1/4
R730	R343330	33K	CF	5	1/4
R732	R437555	4K7	MO	5	7
R733	R130330	1K0	CF	5	1/4
R734	R125319	150R	CF	5	1/2
R735	R333330	3K3	CF	5	1/4
R736	R526330	560R	CF	5	1/4
VR751	0160214R	5K0	VR	HORIZ. SIZE	
R751	R237330	2K7	CF	5	1/4
VR752	E311072	470K	VR	PIN CUSHION ADJ.	
R752	R437330	4K7	CF	5	1/4
R753	R165716	1M5	MF	5	1/4
R754	0700058M	22K	CF	5	1/16
VR755	0160215R	10K	VR	TILT ADJ.	
R755	0187106M	51K	CF	5	1/16
R756	0700061M	33K	CF	5	1/16
R757	R150330	100K	CF	5	1/4
R758	0700049M	4K7	CF	5	1/16
R759	R339330	3K9	CF	5	1/4
R760	R140542	10K	MO	5	1
VR801	0160225	10K	VR	RED BACKGROUND	
R801	0700046M	2K7	CF	5	1/16
VR802	0160225	10K	VR	GREEN BACKGROUND	
R802	0700046M	2K7	CF	5	1/16
VR803	0160225	10K	VR	BLUE BACKGROUND	
R803	0700046M	2K7	CF	5	1/16
R804	0110273S	15K	MO	5	2
VR805	0700037M	560R	CF	5	1/16
R805	0110273S	15K	MO	5	2
VR806	0700037M	560R	CF	5	1/16
R806	0110273S	15K	MO	5	2
R807	R237319	2K7	CF	5	1/2
R808	R237319	2K7	CF	5	1/2
R809	R237319	2K7	CF	5	1/2
R811	0700041M	1K0	CF	5	1/16
R812	0700041M	1K0	CF	5	1/16
R813	0700041M	1K0	CF	5	1/16
R814	0700035M	390R	CF	5	1/16
R815	0700035M	390R	CF	5	1/16
R816	0700035M	390R	CF	5	1/16
R817	0700024M	56R	CF	5	1/16
R818	0700024M	56R	CF	5	1/16
R819	0700024M	56R	CF	5	1/16
R820	0700034M	330R	CF	5	1/16
R821	0700041M	1K0	CF	5	1/16
R821	0700027M	100R	CF	5	1/16 (Signal/ Control panel)
R822	0700041M	1K0	CF	5	1/16
R822	0700027M	100R	CF	5	1/16 (Signal/Control panel)
R823	0700041M	1K0	CF	5	1/16
R823	0700067M	100K	CF	5	1/16 (Signal/Control panel)
R824	R130319	1K0	CF	5	1/2
R851	0700041M	1K0	CF	5	1/16
R852	0700039M	820R	CF	5	1/16

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Ref No.	Part No.	Value	Type	%Tol	Wattage
R853	0700032M	220R	CF	5	1/16
R854	0700054M	10K	CF	5	1/16
R855	0700027M	100R	CF	5	1/16
R901	R842319	82K	CF	5	1/2
R902	0110137M	470R	MO	5	1
R903	R100856	100R	WW	5	5
R904	0700048M	3K9	CF	5	1/16
R905	0700051M	5K6	CF	5	1/16
R906	0700041M	1K0	CF	5	1/16
R907	0700048M	3K9	CF	5	1/16
R908	R120330	100R	CF	5	1/16
R909	0700052M	6K8	CF	5	1/16
R910	0114105M	8R2	MF	5	1/4
R911	R120330	100R	CF	5	1/16
R912	0700032M	220R	CF	5	1/16
R913	R150319	100K	CF	5	1/2
R914	0700057M	18K	CF	5	1/16
R915	0700055M	12K	CF	5	1/16
R916	0700055M	12K	CF	5	1/16
R917	0700041M	1K0	CF	5	1/16
VR951	0160211R	1K0	VR	H.T. ADJ.	
R951	R437330	4K7	CF	5	1/4
R952	R648319	68K	CF	5	1/2
R953	R842319	82K	CF	5	1/2
R954	R832319	8K2	CF	5	1/2
R955	R628330	680R	CF	5	1/4
R957	0110253S	2K2	MF	5	2
R958	0700046M	2K7	CF	5	1/16
R959	0700041M	1K0	CF	5	1/16
R960	0187072M	2K0	CF	5	1/16
R961	0700041M	1K0	CF	5	1/16
R962	0700046M	2K7	CF	5	1/16
R963	0700047M	3K3	CF	5	1/16
R964	R329319	390R	CF	5	1/2
R966	0700064M	56K	CF	5	1/16
R967	R125542	150R	MO	5	1
R968	R230330	2K0	CF	5	1/4
R969	R130330	1K0	CF	5	1/4
R970	R526330	560R	CF	5	1/4
R981	0700041M	1K0	CF	5	1/16
⚠ R999	R170727	10M	MO	5	1
R1301-06	0700027M	100R	CF	5	1/16
R1311	R329319	390R	CF	5	1/2
R1314	R329330	390R	CF	5	1/4
R1315	R526330	560R	CF	5	1/4
R1320	0700065M	68K	CF	5	1/16
R1321	0700065M	68K	CF	5	1/16
R1322	0700054M	10K	CF	5	1/16
R1323	0700054M	10K	CF	5	1/16
R1324	0700051M	5K6	CF	5	1/16
R1325	0700051M	5K6	CF	5	1/16
R1326	0700041M	1K0	CF	5	1/16
R1327	0700041M	1K0	CF	5	1/16
R1399	0700036M	470R	CF	5	1/16
R1401-14	0700027M	100R	CF	5	1/16
R1451	0187038M	75R	CF	5	1/16
R1452	0187038M	75R	CF	5	1/16
R1453	0700067M	100K	CF	5	1/16
R1454	0700067M	100K	CF	5	1/16
R1456	0187038M	75R	CF	5	1/16
R2002	0700027M	100R	CF	5	1/16
R2003	0110105M	2R2	MO	5	1
R2004	0700027M	100R	CF	5	1/16
R2005	0700054M	10K	CF	5	1/16
R2011	0700035M	390R	CF	5	1/16
R2013	0700059M	27K	CF	5	1/16
R2050	0700027M	100R	CF	5	1/16
R2051	0700027M	100R	CF	5	1/16
R2201	0700054M	10K	CF	5	1/16
R2202	0700041M	1K0	CF	5	1/16
R2203-06	0700037M	560R	CF	5	1/16
R2207	0700041M	1K0	CF	5	1/16
R2208	0700059M	27K	CF	5	1/16
R2209	0700067M	100K	CF	5	1/16
R2210	0700021M	33R	CF	5	1/16
R2211	0700021M	33R	CF	5	1/16
R2212	0700021M	33R	CF	5	1/16
R2213	0700027M	100R	CF	5	1/16

Ref No.	Part No.	Value	Type	%Tol	Wattage
R2214	0700027M	100R	CF	5	1/16
R2231	0700051M	5K6	CF	5	1/16
R3100	0700027M	100R	CF	5	1/16
R3101	R526330	560R	CF	5	1/4
R3102	0700037M	560R	CF	5	1/16
R3103	0700057M	18K	CF	5	1/16
R3104	R427330	470R	CF	5	1/4
R3105	0700042M	1K2	CF	5	1/16
R3106	0187062M	750R	CF	5	1/16
R3202	0700067M	100K	CF	5	1/16
R3203	0700041M	1K0	CF	5	1/16
R3204	0700067M	100K	CF	5	1/16
R3204A	R257330	270K	CF	5	1/4
R3205	0700044M	1K8	CF	5	1/16
R3207	0700049M	4K7	CF	5	1/16
R3208	0700048M	3K9	CF	5	1/16
R3209	0700051M	5K6	CF	5	1/16
R3211	0700027M	100R	CF	5	1/16
R3214	0700051M	5K6	CF	5	1/16
R3215	0700051M	5K6	CF	5	1/16
R3216	0700069M	150K	CF	5	1/16
R3217	0700039M	820R	CF	5	1/16
R3218	0700049M	4K7	CF	5	1/16
R3219	0700049M	4K7	CF	5	1/16
R3220	R359330	390K	CF	5	1/4
R3221	0700051M	5K6	CF	5	1/16
R3222	0700051M	5K6	CF	5	1/16
R3224	0700058M	22K	CF	5	1/16
R3225	0700054M	10K	CF	5	1/16
R3226	0700054M	10K	CF	5	1/16
R3227	0700027M	100R	CF	5	1/16
R3228	0700041M	1K0	CF	5	1/16
R3235	0700041M	1K0	CF	5	1/16
R3236	0700041M	1K0	CF	5	1/16
R3237	0700053M	8K2	CF	5	1/16
R3239	0700067M	100K	CF	5	1/16
R3243	0700037M	560R	CF	5	1/16
R3244	0700056M	15K	CF	5	1/16
R4451	0700045M	2K2	CF	5	1/16
R4453	0700041M	1K0	CF	5	1/16
R4454	R234330	24K	CF	5	1/4
R4455	0700023M	47R	CF	5	1/16
R4456	R234330	24K	CF	5	1/4
R4457	0700023M	47R	CF	5	1/16
⚠ R4458	R407551	4R7	FF	5	1/2
⚠ R4459	R407551	4R7	FF	5	1/2
R4460	0700054M	10K	CF	5	1/16
R4461	0700054M	10K	CF	5	1/16
R4462	0700061M	33K	CF	5	1/16
R4463	0700051M	5K6	CF	5	1/16
R4464	R812330	82R	CF	5	1/4
R4465	R339330	3K9	CF	5	1/4
R4466	R120330	100R	CF	5	1/4
R4467	0147524	2R2	WW	10	5
R4468	R427330	470R	CF	5	1/4
R4470	0700063M	47K	CF	5	1/16
R4471	0700054M	10K	CF	5	1/16
R4472	0700054M	10K	CF	5	1/16
R4473	0700027M	100R	CF	5	1/16
R4474	0700038M	680R	CF	5	1/16
R4475	0700043M	1K5	CF	5	1/16
R4476	0700027M	100R	CF	5	1/16
R4477	0700054M	10K	CF	5	1/16
R4601	0700063M	47K	CF	5	1/16
R4604	0700063M	47K	CF	5	1/16
R4605	0700058M	22K	CF	5	1/16
R4606	0700058M	22K	CF	5	1/16
R4607	0187072M	2K0	CF	5	1/16
R4608	0187086M	7K5	CF	5	1/16
R4609	0700056M	15K	CF	5	1/16
R4610	0700063M	47K	CF	5	1/16
R4611	0700056M	15K	CF	5	1/16
R4612	0700063M	47K	CF	5	1/16
R4613	0187072M	2K0	CF	5	1/16
R4614	0187086M	7K5	CF	5	1/16
R4615	0700055M	12K	CF	5	1/16
R4616	0700051M	5K6	CF	5	1/16
R4617	0700063M	47K	CF	5	1/16

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Ref No.	Part No.	Value	Type	%Tol	Wattage
R4618	0700063M	47K	CF	5	1/16
R4619	0700054M	10K	CF	5	1/16
R4620	0700067M	100K	CF	5	1/16
R4621	0700053M	8K2	CF	5	1/16
R4622	0700053M	8K2	CF	5	1/16
R4623	0700054M	10K	CF	5	1/16
R4624	0700062M	39K	CF	5	1/16
R4625	0700053M	8K2	CF	5	1/16
R4626	0700056M	15K	CF	5	1/16
R4627	0700047M	3K3	CF	5	1/16
R4628	0700063M	47K	CF	5	1/16
R4629	0700081M	1M0	CF	5	1/16
R4630	0700072M	220K	CF	5	1/16
R4631	0700072M	220K	CF	5	1/16
R4632	0700064M	56K	CF	5	1/16
R4633	0700064M	56K	CF	5	1/16
R4634	0700067M	100K	CF	5	1/16
R4635	0700067M	100K	CF	5	1/16
R4636	0700054M	10K	CF	5	1/16
R4637	0700054M	10K	CF	5	1/16
R4638-41	0700057M	18K	CF	5	1/16
R4642	0700067M	100K	CF	5	1/16
R4643	0700067M	100K	CF	5	1/16
R4644-47	0700027M	100R	CF	5	1/16
R4648	0700063M	47K	CF	5	1/16
R4649	0700057M	18K	CF	5	1/16
R4650	0700057M	18K	CF	5	1/16
R4651	0700067M	100K	CF	5	1/16
R4652	0700067M	100K	CF	5	1/16
R4653	0700067M	100K	CF	5	1/16
R4654	0700054M	10K	CF	5	1/16
R4655	0700054M	10K	CF	5	1/16
R4656	0700054M	10K	CF	5	1/16
R4657	0700063M	47K	CF	5	1/16
R4658	0700063M	47K	CF	5	1/16
R4659	0187086M	7K5	CF	5	1/16
R4660	0700046M	2K7	CF	5	1/16
R4661	0700054M	10K	CF	5	1/16
R4662	0700054M	10K	CF	5	1/16
R4663	0700054M	10K	CF	5	1/16
R4664	0700063M	47K	CF	5	1/16
R4665	0700063M	47K	CF	5	1/16
R4666	0700067M	100K	CF	5	1/16
R4667	0700067M	100K	CF	5	1/16
R4668	0700041M	1K0	CF	5	1/16
R4669	0700054M	10K	CF	5	1/16
R4671	0700049M	4K7	CF	5	1/16
R4672	0700049M	4K7	CF	5	1/16
R4673	0700027M	100R	CF	5	1/16
R4674	0700027M	100R	CF	5	1/16
R4675	0700027M	100R	CF	5	1/16
R4676	0700054M	10K	CF	5	1/16
R4680	0700041M	1K0	CF	5	1/16
R4681	0700041M	1K0	CF	5	1/16
R4700	0700041M	1K0	CF	5	1/16
R4901	R526319	560R	CF	5	1/2
R4902	R118330	18R	CF	5	1/4
R4903	R407330	4R7	CF	5	1/4
R4904	R232330	2K2	CF	5	1/4
R4905	R118330	18R	CF	5	1/4
R4906	R407330	4R7	CF	5	1/4
R4907	R427319	470R	CF	5	1/2
R4908	R407330	4R7	CF	5	1/4
R4909	R118330	18R	CF	5	1/4
R4910	R427319	470R	CF	5	1/2
R4911	R118330	18R	CF	5	1/4
R4912	R407330	4R7	CF	5	1/14
R4913	0700064M	56K	CF	5	1/16
R4914	0700064M	56K	CF	5	1/16
R4915	0700037M	270K	CF	5	1/16
R4916	0700049M	4K7	CF	5	1/16
R4917	0700058M	22K	CF	5	1/16
R4922	0700049M	4K7	CF	5	1/16
R4924	0700054M	10K	CF	5	1/16
R4925	0700054M	10K	CF	5	1/16
R4927	0700064M	56K	CF	5	1/16
R4928	0700046M	2K7	CF	5	1/16
R4929	0700048M	3K9	CF	5	1/16

Ref No.	Part No.	Value	Type	%Tol	Wattage
R4930	0700067M	100K	CF	5	1/16
R4940	0700041M	1K0	CF	5	1/16
R4941-44	0700055M	12K	CF	5	1/16
R4945	0700054M	10K	CF	5	1/16
R4946	0700065M	68K	CF	5	1/16
R4992	0700054M	10K	CF	5	1/16
R4993	0700054M	10K	CF	5	1/16
R4994	0700054M	10K	CF	5	1/16
R4995	0700067M	100K	CF	5	1/16
R4996	0700067M	100K	CF	5	1/16
R4997	0700067M	100K	CF	5	1/16
R9000	R343549	33K	MO	5	2
R9001	R207330	2R7	CF	5	1/4
R9002	R000706	5K62	MF	1	1/4
R9003	R319330	39R	CF	5	1/4
R9004	R130330	1K0	CF	5	1/4
R9005	R000505	0R5	MO	5	7
R9006	R427549	470R	MO	5	2
R9007	R323330	330R	CF	5	1/4
R9008	R323330	330R	CF	5	1/4
R9010	R150330	100K	CF	5	1/4
R9011	R145330	15K	CF	5	1/4
R9013	R333721	3K3	MF	1	1/4
R9014	R145330	15K	CF	5	1/4
R9015	R142330	12K	CF	5	1/4
R9016	R150330	100K	CF	5	1/4
R9017	R546330	56K	CF	5	1/4
R9018	R417549	47R	MO	5	2
R9019	R353714	330K	MF	5	1/2
R9021	R000707	19.1K	MF	1	1/4
R9022	R000505	0R5	MO	5	7
R9023	R242330	22K	CF	5	1/4
⚠ R9100	R812551	82R	FF	5	1/2
R9101	R138542	1K8	MO	5	1
R9103	R541721	51K	MF	1	1/4
R9104	R145721	15K	MF	1	1/4
R9105	R150330	100K	CF	5	1/4
R9106	R526330	560R	CF	5	1/4
R9107	R252330	220K	CF	5	1/4
R9108	R323542	330R	MO	5	1
R9109	R130330	1K0	CF	5	1/4
R9110	R339330	3K9	CF	5	1/4

For Service Manuals Contact
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Ref No.	Part No.	Value	Type	%Tol	Voltage
C003	0880057R	100n	PF	10	50
C004	0880057R	100p	PF	10	50
C005	0800015R	10u	EL	-	16
C007	0800005R	2u2	EL	-	50
C008	0880057R	100n	PF	10	50
C009	0800032R	33u	EL	-	16
C010	C648715	68n	MPO	10	63
C011-14	0890067R	33p	C	5	50
C016	0890065R	22p	C	5	50
C017	0890065R	22p	C	5	50
C018	0890063R	15p	C	5	50
C019	0890065R	22p	C	5	50
C021	0880044R	10n	PF	10	50
C022	0800056R	220u	EL	-	6.3
C023	0800072R	470u	EL	-	6.3
C024	C343877	33n	C	10	25
C025	0800049R	100u	EL	-	16
C030	0880057R	100n	PF	10	50
C034	0800053R	100u	EL	-	50
C040	0890074R	100p	C	5	50
C101	0800049R	100u	EL	-	16
C102	0800073R	470u	EL	-	10
C103	0800015R	10u	EL	-	16
C104	0880057R	100n	PF	10	50
C121	0800015R	10u	EL	-	16
C122	0800015R	10u	EL	-	16
C123	0880009R	10n	PF	10	50
C124	C150877	100n	C	10	25
C251	0800047R	100u	EL	-	6.3
C252	0800049R	100u	EL	-	16
C304	0800073R	470u	EL	-	10
C314	0800073R	470u	EL	-	10
C321	0800057R	220u	EL	-	10
C322	0800003R	1u0	EL	-	50
C323	0890085R	680p	C	-	50
C324	0800003R	1u0	EL	-	50
C325	0800015R	10u	EL	-	16
C402	0800015R	10u	EL	-	16
C403	0800015R	10u	EL	-	16
C412	0800015R	10u	EL	-	16
C414	0800015R	10u	EL	-	16
C421	0800048R	100u	EL	-	10
C422	0800086N	2200u	EL	-	10
C423	0880051R	33n	PF	10	50
C425	0880041R	5n6	Pf	10	50
C428	0880041R	5n6	PF	10	50
C430	0880051R	33n	PF	10	50
C431	0890087R	1n0	C	-	50
C432	0890087R	1n0	C	-	50
C438	0800003R	1u0	EL	-	50
C442	0800081	1000u	EL	-	10
C446	0800003R	1u0	EL	-	50
C470	0252396R	10u	EL	-	16
C471	0252396R	10u	EL	-	16
C472	0880044R	10n	PF	10	50
C473	0880044R	10n	PF	10	50
C481	0880042R	6n8	PF	10	50
C482	0880042R	6n8	PF	10	50
C483	0800039R	47u	EL	-	10
C484	0890074R	100p	C	5	50
C485	0800039R	47u	EL	-	10
C486	0890074R	100p	C	5	50
C487	0880057R	100n	PF	10	50
C488	0800073R	470u	EL	-	10
C489	0800024R	22u	EL	-	25
C490	0800024R	22u	EL	-	25
C491	0800015R	10u	EL	-	16
C492	0800015R	10u	EL	-	16
C493	0880057R	100n	PF	10	50
C494	0880057R	100n	PF	10	50
C501	0880044R	10n	PF	10	50
C502	0880057R	100n	PF	10	50
C503	0890067R	33p	C	5	50
C507	0880044R	10n	PF	10	50
C511	0800023R	22u	EL	-	16
C512	0880057R	100n	PF	10	50
C513	0890074R	100p	C	5	50
C514	0880037R	3n3	PF	10	50

Ref No.	Part No.	Value	Type	%Tol	Voltage
C515	C457715	470n	MPO	10	63
C517	0276721R	220n	PF	5	50
C518	0880057R	100n	PF	10	50
C520	0800081N	1000u	EL	-	10
C521	0276717R	100n	PF	5	50
C522	0880057R	100n	PF	10	50
C523	0880057R	100n	PF	10	50
C524	0890118R	22p	C	5	50
C525	0880053R	47n	PF	10	50
C526	0880051R	33n	PF	10	50
C527	0800005R	2u2	EL	-	50
C528	0800081N	1000u	EL	-	10
C530	0276717R	100n	PF	5	50
C531	0880057R	100n	PF	10	50
C533	0880057R	100n	PF	10	50
C534	0800015R	10u	EL	-	16
C541	0800015R	10u	EL	-	16
C542	0800015R	10u	EL	-	16
C544	0276717R	100n	PF	5	50
C545	C150715	100n	MPO	10	63
C546	0880057R	100n	PF	10	50
C547	0890078R	220p	C	10	50
C548	0800044R	10n	PF	10	50
C570	0890075R	120p	C	5	50
C578	0800052R	100u	EL	-	31.5
C581	0276717R	100n	PF	5	50
C582	0800122R	10u	EL	-	16
C583	0276717R	100n	PF	5	50
C584	0800122R	10u	EL	-	16
C585	0276717R	100n	PF	5	50
C586	0800122R	10u	EL	-	16
C587	0800049R	100u	EL	-	16
C588	0890078R	220p	C	10	50
C591	0890074R	100p	C	5	50
C592	0880044R	10n	PF	10	50
C593	0880048R	22n	PF	10	50
C594	0890114R	10p	C	-	50
C595	0890074R	100p	C	5	50
C596	0880031R	1n0	PF	10	50
C599	0800081N	1000u	EL	-	10
C601	0254506R	220u	EL	-	16
C602	0276729	1u0	PF	5	50
C603	0258112R	100u	EL	-	50
C604	0890061R	10p	C	-	50
C605	0252416R	0u47	EL	-	50
C606	0253934	2200u	EL	-	31.5
C607	0279693R	100n	PF	10	100
C608	0253046R	10u	EL	-	16
C609	0800009R	0u47	EL	-	25
C610	0880031R	1n0	PF	10	50
C611	0800077N	470u	EL	-	50
C612	0880009R	10n	PF	10	50
C614	0800009R	4u7	EL	-	25
C616	0800009R	4u7	EL	-	25
C617	C252715	220n	MPO	10	63
C701	0253491	100u	EL	-	200
C702	0800044R	47u	EL	-	50
C703	0250511R	22n	PF	10	50
C704	0244501R	1n0	C	10	50
C705	0890074R	100p	C	5	50
C706	0262435	8n2	PF	-	1800
C707	0299995F	27n	PF	5	630
C708	0246344	100p	C	10	2000
C709	0246357	1n0	C	10	2000
C710	0244507R	3n3	C	10	500
C711	0243512R	820p	C	10	500
C712	0246364	3n3	C	10	2000
C712A	0244213	1n5	C	10	2000
C713	0253952R	1u0	EL	-	160
C713A	0253952R	1u0	EL	-	160
C714	0299931F	270n	PF	10	200
C715	0299932F	330n	PF	10	200
C716	0800084N	1000u	EL	-	31.5
C717	0243507R	330p	C	10	500
C718	0253971	4u7	EL	-	250
C719	0800015R	10u	EL	-	16
C720	C343710	33n	MPO	10	250
C721	0880031R	1n0	PF	10	50

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Ref No.	Part No.	Value	Type	%Tol	Voltage
C722	0880031R	1n0	PF	10	50
C723	0299995F	27n	PF	5	630
C724	0800052R	100u	EL	-	31.5
C725	0246357	1n0	C	10	2000
C726	0800109R	1u0	EL	-	50
C750	C140715	10n	MPO	10	63
C751	0299932F	330n	PF	10	200
C752	0299929	180n	PF	10	200
C753	0800018R	10u	EL	-	50
C755	C447715	47n	MPO	10	63
C756	C232715	2n2	MPO	10	63
C757	C140877	10n	C	10	25
C758	0800052R	100u	EL	-	31.5
C759A	C150715	100n	MPO	10	63
C801	0255031	47u	EL	-	200
C802	0890078R	220p	C	10	50
C803	0890078R	220p	C	10	50
C804	0890078R	220p	C	10	50
C805	0890079R	270p	C	10	50
C806	0890079R	270p	C	10	50
C806	0800057R	220u	EL	- (Signal/control panel)	10
C807	0890079R	270p	C	10	50
C808	0243512R	820p	C	10	500
C851	0800015R	10u	EL	-	16
C852	0880044R	10n	PF	10	50
C853	0800049R	100u	EL	-	16
C854	0800001R	0u47	EL	-	50
C880	0245612	4n7	C	10	1000
C880A	E884110	10n	SPARK GAP		2000
C901	0279698	220n	PF	10	250AC
⚠ C902	0249296R	10n	C	10	250AC
⚠ C903	0249395	4n7	C	10	250AC
⚠ C904	0249395	4n7	C	10	250AC
C905	C001544	220u	EL	-	400
C906	0244215R	2n2	C	10	2000
C907	0880044R	10n	PF	10	50
C908	C457715	470n	MPO	10	63
C909	0880033R	1n5	PF	10	50
C910	0800032R	33u	EL	-	16
C911	0890074R	100p	C	5	50
C912	C457715	470n	MPO	10	63
C913	0890081R	330p	C	10	50
⚠ C914	0249498	1n0	C	10	500
C915	0246353	470p	C	10	2000
C916	C648727	68n	MPO	10	630
C951	0246353	470p	C	10	2000
C952	0259431	220u	EL	-	200
C953	0880053R	47n	PF	10	50
C954	0800087N	2200u	EL	-	16
C955	0800049R	100u	EL	-	16
C956	0244505R	2n2	C	10	500
C957	0243509R	470p	C	10	500
C958	0800049R	100u	EL	-	16
C959	0243509R	470p	C	10	500
C960	0253935	3300u	EL	-	35
C961	0880053R	47n	PF	10	50
C962	0800073R	470u	EL	-	10
⚠ C998	0249498	1n0	C	10	250AC
⚠ C999	0247974	2n2	C	10	250AC
C1301	0800015R	10u	EL	-	16
C1302	0880041R	5n6	PF	10	50
C1303	0800003R	1u0	EL	-	50
C1304	0880041R	5n6	PF	10	50
C1305	0800003R	1u0	EL	-	50
C1306	0800015R	10u	EL	-	16
C1307	0800005R	2u2	EL	-	50
C1309	0800048R	100u	EL	-	10
C1320	0252396R	10u	EL	-	16
C1321	0252396R	10u	EL	-	16
C1401	0800015R	10u	EL	-	16
C1402	0800015R	10u	EL	-	16
C1403	0800015R	10u	EL	-	16
C1404	0880044R	10n	PF	10	50
C1405	0800015R	10u	EL	-	16
C1406	0800015R	10u	EL	-	16
C1407	0800015R	10u	EL	-	16

Ref No.	Part No.	Value	Type	%Tol	Voltage
C1408	0880044R	10n	PF	10	50
C1409-14	0800015R	10u	EL	-	16
C1416	0800081R	1000u	EL	-	10
C1418	0800049R	100u	EL	-	16
C2001	0800072R	470u	EL	-	6.3
C2002	0800015R	10u	EL	-	16
C2201	0890078R	220p	C	10	50
C2202	0890063R	15p	C	5	50
C2203	0890063R	15p	C	5	50
C2204	0890078R	220p	C	10	50
C2205	0880009R	10n	PF	10	50
C2206	0880009R	10n	PF	10	50
C2209	0276717R	100n	PF	5	50
C2210	0880003R	1n0	PF	10	50
C2211	0276725R	470n	PF	5	50
C2213	0800109R	1u0	EL	-	50
C2214	0800127R	22u	EL	-	10
C2215	0276717R	100n	PF	5	50
C2216	0276717R	100n	PF	5	50
C2217	0800122R	10u	EL	-	16
C2227	0800143R	100u	EL	-	6.3
C2228	0800122R	10u	EL	-	16
C2229	0276717R	100n	PF	5	50
C2231	0890118R	22p	C	5	50
C3100	0252420R	4u7	EL	-	50
C3101	0800015R	10u	EL	-	16
C3202	0800049R	100u	EL	-	16
C3203	0800049R	100u	EL	-	16
C3204	0880009R	10n	PF	10	50
C3205	0880009R	10n	PF	10	50
C3206	0890115R	12p	C	5	50
C3207	0800003R	1u0	EL	-	50
C3208	0880009R	10n	PF	10	50
C3209	0880009R	10n	PF	10	50
C3210	0252396R	10u	EL	-	16
C3211	0880009R	10n	PF	10	50
C3212	0800003R	1u0	EL	-	50
C3213	0243510R	560p	C	5	500
C3214	0880031R	1n0	PF	10	50
C3215-18	0800015R	10u	EL	-	16
C3219	0800003R	1u0	EL	-	50
C3221	0252417R	1u0	EL	-	50
C3222	0800003R	1u0	EL	-	50
C3223	0890122R	39p	C	5	50
C4451	0800042R	47u	EL	-	25
C4452	0800041R	47u	EL	-	16
C4453	0254518R	47u	EL	-	25
C4454	0880057R	100n	PF	10	50
C4455	0880057R	100n	PF	10	50
C4456	0800084	1000u	EL	-	31.5
C4457	0800084	1000u	EL	-	31.5
C4458	0253934	2200u	EL	-	31.5
C4459	0880057R	100n	PF	10	50
C4460	0890087R	1n0	C	-	50
C4461	0880031R	1n0	PF	10	50
C4462	0800003R	1u0	EL	-	50
C4463	0800049R	100u	EL	-	16
C4470	0890092R	2n2	C	10	50
C4471	0890092R	2n2	C	10	50
C4473	0800015R	10u	EL	-	16
C4601	C150877	100n	C	10	25
C4602	0244117R	680p	C	10	50
C4603	C140877	10n	C	10	25
C4604	C145877	15n	C	10	25
C4605	0800015R	10u	EL	-	16
C4607	0800015R	10u	EL	-	16
C4608	0800015R	10u	EL	-	16
C4609	C457421	470n	C	+80/-20	50
C4610	0800049R	100u	EL	-	16
C4611	C150877	100n	C	10	25
C4612	0253943R	0u33	EL	-	50
C4613	C150877	100n	C	10	25
C4614	C150877	100n	C	10	25
C4615	0244117R	680p	C	10	50
C4616	0800009R	4u7	EL	-	25
C4617	0800009R	4u7	EL	-	25
C4618	C155715	150n	MPO	10	63
C4619	0800007R	3u3	EL	-	50

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Ref No.	Part No.	Value	Type	%Tol	Voltage
C4620	C155715	150n	MPO	10	63
C4621	C155715	150n	MPO	10	63
C4622	0800007R	3u3	EL	-	50
C4623	C155715	150n	MPO	10	63
C4624	0800009R	4u7	EL	-	25
C4625	0800009R	4u7	EL	-	25
C4626	0244117R	680p	C	10	50
C4627	0253943R	0u33	EL	-	50
C4628	C150877	100n	C	10	25
C4629	C150877	100n	C	10	25
C4630	0800015R	10u	EL	-	16
C4631	0800015R	10u	EL	-	16
C4632	0800049R	100u	EL	-	16
C4633	0800042R	47u	EL	-	25
C4634	0800049R	100u	EL	-	16
C4635	C252715	220n	MPO	10	63
C4636	C140877	10n	C	10	25
C4637	0252396	10u	EL	-	16
C4638	C252715	220n	MPO	10	63
C4639	0244117R	680p	C	10	50
C4640	0800015R	10u	EL	-	16
C4641	0800015R	10u	EL	-	16
C4642	0800015R	10u	EL	-	16
C4643	C638877	6n8	C	10	25
C4644	0880041R	5n6	PF	10	50
C4645	0244115R	560p	C	10	50
C4646	0800015R	10u	EL	-	16
C4647	0252396R	10u	EL	-	16
C4648	0800015R	10u	EL	-	16
C4649	0800003R	1u0	EL	-	50
C4650	0252396R	10u	EL	-	16
C4651	C437877	4n7	C	10	25
C4652	C343715	33n	MPO	10	63
C4653	0880038R	3n9	PF	10	50
C4654	C648715	68n	MPO	10	63
C4655	0253942R	0u22	EL	-	50
C4656	0248670R	27p	C	5	50
C4657	0248670R	27p	C	5	50
C4658	C150877	100n	C	10	25
C4659	0800058R	220u	EL	10	16
C4660	C140877	10n	C	10	25
C4661	C457421	470n	C	+80/-20	50
C4662	0800058R	220u	EL	-	16
C4663	0800058R	220u	EL	-	16
C4664	0800058R	220u	EL	-	16
C4665	0890076R	150p	C	10	50
C4666	C242877	22n	C	10	25
C4667	0890087R	1n0	C	-	50
C4668	0800009R	4u7	EL	-	25
C4669	0800074	470u	EL	-	16
C4670	0800009R	4u7	EL	-	25
C4671	0890087R	1n0	C	-	50
C4672	C242877	22n	C	10	25
C4673	0890076R	150p	C	10	50
C4674	C155715	150n	MPO	10	63
C4675	0800049R	100u	EL	-	16
C4676	0800049R	100u	EL	-	16
C4678	0800049R	100u	EL	-	16
C4679	0800049R	100u	EL	-	16
C4680	0252396R	10u	EL	-	16
C4681	0800049R	100u	EL	-	16
C4682	0800049R	100u	EL	-	16
C4683	0252396R	10u	EL	-	16
C4684	0252396R	10u	EL	-	16
C4685	0252396R	10u	EL	-	16
C4686	0800087R	1n0	C	-	50
C4687	0800087R	1n0	C	-	50
C4688	C343715	33n	MPO	10	63
C4689	0880041R	5n6	PF	10	50
C4690	0880041R	5n6	PF	10	50
C4691	C343715	33n	MPO	10	63
C4693	0800015R	10u	EL	-	16
C4694	0800049R	100u	EL	-	16
C4695-98	0800015R	10u	EL	-	16
C4699	0800003R	1u0	EL	-	50
C4700-03	0800015R	10u	EL	-	16
C4901	C252715	220n	MPO	10	63
C4902	0800058R	220u	EL	-	16

Ref No.	Part No.	Value	Type	%Tol	Voltage
C4903	0253934	2200u	EL	-	31.5
C4904	C150715	100n	MPO	10	63
C4905	C150715	100n	MPO	10	63
C4906	C150715	100n	MPO	10	63
C4907	0800052R	100u	EL	-	31.5
C4908	0800026R	22u	EL	-	50
C4909	C140715	10n	MPO	10	63
C4910	0800026R	22u	EL	-	50
C4911	0800087	2200u	EL	-	16
C4912	0253934	2200u	EL	-	31.5
C4913	0800026R	22u	EL	-	50
C4914	0880044R	10n	PF	10	50
C4915	0800052R	100u	EL	-	31.5
C4916	0800026R	22u	EL	-	50
C4917	C150715	100n	MPO	10	63
C4918	C150715	100n	MPO	10	63
C4919	C150715	100n	MPO	10	63
C4920	0800087	2200u	EL	-	16
C4921	0800026R	22u	EL	-	50
C4922	C140715	10n	MPO	10	63
C4923	0253935	3300u	EL	-	35
C4924	C150715	10n	MPO	10	63
C4925	0880053R	47n	PF	10	50
C4926-29	0244105R	2n2	C	10	50
C4932	0244105R	2n2	C	10	50
C4934	0244105R	2n2	C	10	50
C4935	0244105R	2n2	C	10	50
C4936	0800058R	220u	EL	-	16
C4939	0800052R	100u	EL	-	31.5
C4940	0244105R	2n2	C	10	50
C4941	0880031R	1n0	PF	10	50
C4991	0800003R	1u0	EL	-	50
C4992	0800003R	1u0	EL	-	50
C4993	0800003R	1u0	EL	-	50
C4994	0244105R	2n2	C	10	50
⚠ C9000	0279697	100n	PF	20	250
⚠ C9001	0279697	100n	PF	20	250
C9002	0253873	47u	EL	-	400
C9003	0800069	330u	EL	-	50
C9004	C333713	3n3	PF	2	100
C9005	C135715	1n5	MPO	10	63
C9006	C140715	10n	MPO	10	63
C9007	C222863	220p	C	10	100
C9008	C150715	100n	MPO	10	63
C9009	0246353	470p	C	10	2000
C9010	0244509R	4n7	C	10	500
⚠ C9011	0249395	4n7	C	10	250AC
⚠ C9012	0249395	4n7	C	10	250AC
C9013	0800018R	10u	EL	-	50
C9014	C323182	330p	C	2	50
C9023	C121143	120p	C	2	100
C9100	0253935	3300u	EL	-	35
C9101	0800075	470u	EL	-	25
C9102	0246344	100p	C	10	2000
C9103	0246344	100p	C	10	2000
C9105	0249500	1n5	C	20	400AC
C9106	C323182	330p	C	2	50
C9107	C333713	3n3	PF	2	100
C9108	0800049R	100u	EL	-	16
C9111	C140715	10n	MPO	10	63

For Service Manuals Contact
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